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Photo by Acme News Pictures, Inc.

THE COVER

Newest Air View of New York World's Fair, New York—A photograph, taken from the Bermuda Clipper, showing the present appearance of the New York World's Fair, 1939, particularly a section of the central exhibit area. Left foreground, at juncture of Grand Central Parkway Extension and Long Island Railroad, Administration Building; just beyond, Communication Building with twin illumination pylons facing into Theme Center, with its intricate steelwork for Perisphere and Trylon. Right foreground, in corner of transportation zone, first steel of Railroad Building before overpass leading to Business Systems Building, and, further right, New York City Building among formal gardens. Close behind the needlelike beacon, the Hall of Mines and Metallurgy between (right) the Consolidated Edison Building, and (left) the Consumers Building; across from the latter the Hall of Medicine and Public Health; and farther along Constitution Mall (left), a Food Building, and (right) the Fisheries Building. Another Food Building is shown beyond the Theme Center toward the Stream, while further right, along Horace Harding Boulevard, is the Chemicals and Plastics Building. Extreme left centerground, an entrance plaza with the Hall of Textiles opposing the circle of the Johns Manville Building and beyond (left) the Hall of Building Materials, and (right) the Shelter Building. Note the patterns of numerous foundations and construction on varied plots, particularly the increasing works of the Government zone beyond the Mall's oval lagoon.

"Advance" visitors to the World's Fair recently included a caravan of 1000 Engineers from the State of Connecticut. (Story on page 21). This trip was sponsored by the Connecticut Society of Professional Engineers and the Connecticut Society of Civil Engineers.

The American Engineer assumes no responsibility for statements or opinions expressed by contributors. Their names identify the source of the same.

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EDITORIAL . . .

IMPRESSIONS

We were impressed with Dean Holbrook's statement: "Frankly, Gentlemen, a year or more ago I was absolutely opposed to the professional engineering movement in this form . . . Now I am whole-heartedly in favor of it!"

We were impressed with the sincerity and enthusiasm of engineers discussing professional problems, and with the harmony and good will among the members!

We were impressed by the two years of sacrifice of time and money on the part of the retiring president, Arthur V. Sheridan, without any hint of it from him!

We were impressed by the ardent enthusiasm of the national secretary, Willard S. Conlon, who fights day and night for a cause on which he is wholeheartedly sold!

We were impressed with the close contact and guidance which the father of the society, Dr. D. B. Steinman, continues to give, and incidentally with the instructive and pleasing manner in which his bridge talk was presented.

We were impressed with the modest way in which the general chairman, Sam Eckels, went about his duties of facilitating the convention program, and the unselfish devotion of his Pittsburgh Chapter members, including Roswell Canfield and Ben Aires.

We were impressed with the trend of the professional movement westward; with the serious minded and capable new president, Perry T. Ford, of Ohio, digging into his new opportunities immediately; with the desire of his state to sponsor the 1939 convention which is to be held at Cincinnati.

We were impressed with the record of accomplishment of the national society and its constituent members, the state societies, during the past year—with their growth, their raising of professional standards; obtaining employment for members and reaching a clearer understanding with other professional groups.

We were impressed with the value of the basic concept of the organization; a society of autonomous state groups each electing its representatives to the national society, and with that national body being merely a coordinating agency promoting further growth and a guide to maintaining the principles upon which the society has been founded.

Lastly, we were impressed with the fact that our society's accomplishment curve is still moving upward. When it starts to decline, we will warn you quickly.

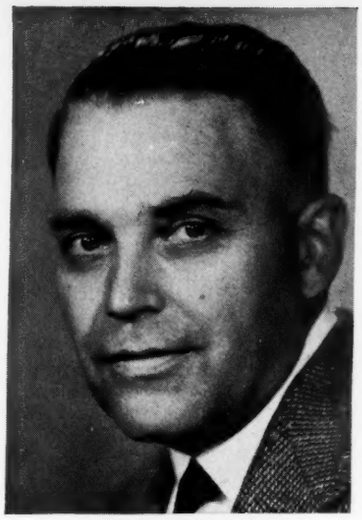
These impressions are all favorable and encouraging ones. So let each officer of the twenty-two state societies, and each officer of the national society, dedicate himself to the year's work ahead, knowing that all his efforts are given freely for the profession to which he is devoting his life!

—ROBERT HALL CRAIG.

NEW OFFICERS

of the National Society of Professional Engineers for 1939

Elected at the Fourth Annual Convention in Pittsburgh, Pa., Oct. 17, 18 and 19, 1938



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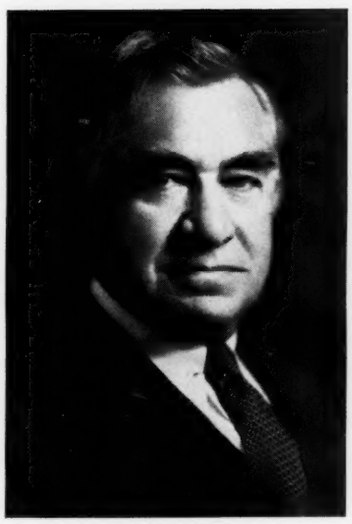

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TRANSCRIPT OF MINUTES

of the Fourth Annual Convention, National Society of Professional Engineers Held in Pittsburgh, Pennsylvania, October 17, 18 and 19, 1938

MONDAY MORNING SESSION

October 17, 1938

The Fourth Annual Convention of the National Society of Professional Engineers was held in the William Penn Hotel, Pittsburgh, Pennsylvania, October 17-18-19, 1938.

The Monday Morning Session convened in the Cardinal Room of the William Penn Hotel at ten-twenty o'clock, Engineer Samuel Eckels, Chairman of the Convention Committee, presiding.

In calling the meeting to order, Engineer Eckels offered the facilities of the Local Chapter's rooms in the William Penn Hotel to the delegates, as well as those of the American Society of Tool Engineers.

CHAIRMAN ECKELS: In January of this year, the Pittsburgh Chapter of Professional Engineers was notified by the National Society that Pittsburgh had been selected as the place of meeting for the 1938 Convention. The selection was appropriate, for here we have a great center of engineering activity, two progressive Engineering Schools, many of the greatest engineering research laboratories, nationally known and approved testing laboratories, a great art center, and a people accustomed to and who encourage scientific thought. Constant association with engineering works leads to the development of the minds of those scientifically inclined.

Pittsburgh and vicinity has long been the land of apportunity for young men. It is represented in all walks of life, whether it be Art, Music, Industry, Banking, Electricity, Steel, Radio, Aluminum, or Transportation.

It does not follow that our successful men are born to inherit large fortunes, nor did they aspire to accumulate them. Let's mention casually only a few: Stephen Foster; Charles Wakefield Cadman; John A. Brashear; George Westinghouse; Charles Schwab; H. C. Frick; P. C. Knox; A. W. Mellon; Andrew Carnegie; Langley; etc. With one exception, you could not call them rich men's sons.

The fact that some may have amassed large fortunes is no excuse for calling them fancy names. A pioneer Democracy, such as ours, needed such men, and without men of this type, we would not be what we are today.

Nor is that all. Their successors are just as good and perhaps better. Every day you hear of some young fellow being promoted to head some large organization, and wonder about it. It is a natural course of events; it is necessary if we are to go ahead; without it, we would stagnate.

The man who will welcome you to Pittsburgh is a graduate of Allegheny College, Pennsylvania, where he played guard on the football team. He therefore knows the meaning of team work. After graduation, he studied law and started his practice here.

He became affiliated with the Philadelphia Company and later became the president of that company. Many may have wondered how that came about. I will tell you. It was only after sincere effort and constant application to the job at hand. Hard work did it. Financial influences were not back of him. Ability was the only cause for the choice.

The business of the Philadelphia Company increased under his guidance, and others soon became aware that here was a man of broad and sound reasoning, quiet spoken, and above all, economically sound.

When Westinghouse Electric and Manufacturing Company needed a man to be Chairman of this Board, they sought this man. While he is not an engineer, he has faith in the engineer, and relies on engineering research and facts.

It is an honor and a pleasure to introduce A. W. (Andy) Robertson, Chairman of the Board of Westinghouse Electric and Manufacturing Company, who will welcome you to our city. Mr. Robertson.

MR. A.W. ROBERTSON: I suppose it would only be natural that when a man meets a group of new people, some of which are old friends, his mind goes back to his youth. When I saw Sam Eckels, Charlie Finley, and some I don't see so often, it carried me back, and I said, "You don't need to get fooled. Your hair is still gray." And I see enough bald heads here today, which brings to mind an incident the other day, which brought me up short.

A group of men wanted us to do something of a civic nature. They were important men. They were customers. After listening, I said, "I am too busy."

They said, "You don't have to do any work. You just get it organized. Get some of these young fellows organized."

I thought yesterday, just yesterday, I was a young fellow trying to get some work. Charlie Finley remembered very well when I was a young fellow carrying a satchel around. I don't feel exactly at home welcoming you people here, you technical men, you engineering men.

I am reminded of a pet phrase we have in our company, that an expert—and I wouldn't want to insinuate that you will qualify in this particular respect—but an expert is a person that knows more and more about less and less, and after the executives heard it, they were pleased to offer that an executive is one that knows less and less about more and more, so that we don't register well always in the technical crowd, but I think we are always sort of pleased that we are invited to have anything to do with you, because we realize that you are the only people that know anything exactly, and I think the world sometimes loses sight of the fact where the knowledge that runs the world comes from anyway.

We can't always see what the engineer does, or we take it as a matter of course. I am reminded of my trip recently in an airplane, and looking out the front I saw the ground below, and it suddenly came to me with a shock that there wasn't any propeller on the end of that motor there. But I finally decided from what little knowledge of engineering I had that there was a propeller there, but I just couldn't see it, and if I had been the type of person that believes only what he sees, I would have made up my mind that the ship ran itself. And sometimes when we don't understand these things, we think the world runs itself, and I think oftentimes in that respect the world neglects to appreciate what the engineer does. Of course, that is not true in Pittsburgh.

Pittsburgh is the source of a great deal of wealth, largely through its use of engineering. We have here the great research laboratories where science has explored, and we have here the great engineering talents where the knowledge of humanity is put together to the advantage of mankind.

We are a dirty city at times, such as winter mostly, but we are also a very lovely city in other months, and I am sure before this day is over you will get an idea of what a delightful climate we really have here, and we are proud to be thought the center of engineering.

We speak with a good deal of pride in the fact that we are at the junction of three great rivers, and it is rather significant that while there has been great change, and while we are sometimes thought not to be as much the center of steel and iron industry as we used to be, we are proud that the greatest steel plant in the world is being erected here now while they could erect it anywhere in the world, but it is here.

The rivers carry more iron and coal than the Panama Canal. It is the center, and will continue to be.

Also, Pittsburgh is the home center of the Westinghouse Electric and Manufacturing Company, where we have our manufacturing research, and great plants, and also the center of a great many other things, so we feel pleased to welcome you here.

In just looking over this community and educating myself, as it were, I was astonished to find that this county of ours, Allegheny County, which is what we think of as Pittsburgh, pays a hundred times more income tax than the state of North Dakota, for instance; that we have more population here than any one of sixteen states. In other words, it has been said more or less jokingly, that we could be a state in ourselves compared to any other smaller Western population.

We undoubtedly would qualify, but it is significant, speculating for a moment about this world that disturbs all of us once in a while, that the people that live here don't have two Senators

(Continued on page 24)

Engineering as a Career

By **Dr. D. B. STEINMAN**

To Young Men—To Parents and Teachers:

To present an objective and factual picture of what is in store for the prospective engineering graduate,—as recorded by those working in the profession and not as rosily painted by engineering educators who, in the security of their academic halls, are sheltered from the full impact of the economic struggle,—

To offset alluring and misleading propaganda through which engineering schools seek to promote and stimulate ever-increasing enrollment beyond the capacity of the profession to absorb,—and

To save the heartbreak and the disillusionment of young graduates who are unable to gain a foothold in their chosen profession, and the hopelessness and despair of older men who find professional employment precarious, underpaid or unobtainable:

This outline of "Engineering as a Career" is presented.

Engineering—Engineering is the trained application of the mathematical and physical sciences to the economic planning, design, and construction of utilities, structures, machines and processes. The five major fields are Civil, Mechanical, Electrical, Chemical and, Mining. The essential basic studies and training are identical for all fields, and only a smaller part of the final collegiate training is differentiated or specialized.

Who Should Study Engineering?—The highest aptitudes in Mathematics, Physics, and Chemistry, are indispensable, both as preparation and as criteria. With out thorough facility in, and mastery of, the mathematical and physical sciences, much time in the engineering school is wasted. Any student who finds difficulty in these basic studies, or who does not stand at or near the top of his class in these subjects in High School or in a pre-engineering college course, should choose some other calling.

No young man should choose engineering unless he is ready to dedicate himself to a life of hard work and inflexible integrity, with the realization that he will have to make many sacrifices and miss many of the things that other men value in order to maintain his professional standards and standing.

No young man should choose engineering as a career on the basis of any anticipated monetary returns. If that is an important consideration, he is sincerely advised to choose some other vocation. If, on the other hand, he has demonstrated outstanding ability in the mathematical and physical sciences and if, moreover, he knows in his heart that engineering is the only calling for him, despite the prospects of inadequate and uncertain material rewards,—then and only then should he adopt engineering as his life work.

"Those who are attracted by the spectacular and romantic should understand the nature of the severe discipline ahead of them and make their decision with their eyes open to the realities."

Required and Recommended Training.—1. Completion of the standard four-year high school course is required. (This should include all possible high school courses in Mathematics, Physics, Chemistry, and Descriptive Geometry.) 2. Two or more years of pre-engineering college training (including cultural courses as well as more advanced courses in Mathematics, Physics, Chemistry and Theoretical Mechanics) are highly desirable, although not yet generally required, before enrollment in an engineering school. 3. Graduation from an approved curriculum of four years or more in an accredited school or college of engineering is required. (Prospective students are cautioned to select only approved and registered schools and colleges, since no credit is given for study at any institution that is not on the accredited list.) 4. Following such graduation, there is required an internship or period of practical experience in engineering work of four years or more, under the supervision of qualified engineers, before the young man is admitted to the licensing examinations. During this apprenticeship period, and in further preparation for his qualifying examination, the engineer-in-training is expected to continue his education through systematic reading and intensive study, along cultural, technical, and professional lines. In fact, even after becoming a full-fledged engineer, as evidenced by legal admission into the profession, the practitioner will find continued serious study necessary throughout his life, both for broadening his foundation and for keeping abreast of the advances in the field of his specialization.

Registration or Licensing—In 40 of the 48 states, Engineers' Registration Laws are now in force. Under these statutes, it is generally unlawful for a person to practice engineering or to use the designation "engineer" in any professional connotation unless he is registered or licensed as a Professional Engineer. The basic requirements for such registration include age, citizenship, character, completion of secondary and professional education, then four or more years of satisfactory apprenticeship, and, finally, the passing of the prescribed written and oral examinations. These examinations cover both theory and practical applications of the basic engineering sciences, engineering principles and methods, and engineering economics, ethics, and practice.

How Many Are Employed?—There are now approximately 200,000 living engineering graduates (age 25 to 64). Of these only about 60,000 (or 30%) are employed in positions of professional status, and approximately 40,000 (or 20%) are employed as draftsmen or in other subordinate technical positions of sub-professional character. The remainder (100,000, or 50%) are either unemployed or have otherwise dropped out of the engineering profession. Unlike other professions, the opportunities for independent private practice in engineering are extremely limited. Only about 5 percent of all engineers are in private practice, with uncertain income, and the remaining 95 percent are employees working for salaries, with uncertain tenure of employment. Most engineering work is not individual or personal, but is generally routinized group work in large organizations.

Duration of Employment—Engineering organizations are compelled by stern economic necessity to hire and fire men with the fluctuations in the amount of work available. The usual duration of a job is from a few months to a year or two, and the engineer faces the ordeal of hunting for new employment at the termina-

tion of each engagement. In hard times, such situation generally develops into a hopeless quest for work.

Earnings of Engineers—The median monthly earnings of engineers are as follows:

First year after graduation	$55 to $110
Ten years after graduation	$210 to $300
Thirty years after graduation ..	$290 to $430
Forty years after graduation	$260 to $360.

In each case, the higher of the two figures given refers to times of maximum prosperity, as in 1929, and the lower of the two figures refers to periods of depression, as in 1934. The foregoing figures are the earnings of the average engineer, and there is some range of variation both above and below the median. Furthermore, these are the earnings for the survivors, or those who have remained in engineering up to the respective stages, and the later figures do not reflect the termination of earnings or the change of occupation of the progressively increasing numbers of those who drop out of the profession.

Industrial corporations on the look-out for low cost engineering services are, in a measure, to blame for this condition. Graduates launching their careers accept industrial jobs at nominal pay, to find later that there is no future and a steady stream of new graduates waiting to take their jobs at even lower wages.

There are many thousands of competent engineers who wish they could earn as much as bricklayers, plumbers, painters, ironworkers, plasterers, or mechanics.

Duration of Earnings—Following graduation in engineering, there is a period of apprenticeship of five or ten years at low earnings before positions of a professional grade are attained. Few graduates reach this stage before the age of 30. The engineer then has only about 20 years in which to realize on his investment of all the years of study, preparation, and training that have preceded, for at about age 50 there usually occurs a sharp downward break in the earnings curve followed by complete termination of earnings generally at or before age 65. For the engineer who finds himself unemployed after he reaches the dead-line of 45 or 50, the situation is generally hopeless.

Unemployment—Unemployment among engineers ranges from 10 percent in good times to 30 to 50 percent in periods of depression or recession. In other words, an engineer on the average may expect to be jobless 10 percent of the time in periods of prosperity, and without earnings or on work relief 30 to 50 percent of the time in periods of economic stress.

A recent Government report shows that, from 1929 to 1934, earnings of engineers in the respective classifications and age groups declined by amounts ranging from 25 percent to 70 percent. Many engineers, even though they were in those ages at which engineering earnings reach a peak, reported that they had made less than $300 in the entire *year* of 1934, and many recent graduates had made less than $114 in that year. From 1929 to 1934, many non-engineering jobs were accepted, not by preference but as the only alternative to unemployment, governmental charity, or starvation. Engineers took jobs as gasoline station attendants, apartment house janitors, and common laborers, many of them never again regaining a foothold in their chosen profession.

Is the Field Too Crowded?—Yes, there are too many engineering schools (good and bad) competing for enrollment, and too many engineering graduates are being turned out annually. The number of engineering schools in this country, by eliminating the substandard, should be reduced from 160 to 100. To maintain a constant ratio of engineers to population, allowing for mortality and population growth, the total number of students in our engineering schools and colleges should be reduced from 70,000 to 30,000; the number admitted annually should be reduced from 27,000 to 10,000; and the number graduating annually should be reduced from 11,000 to 5,000. With the present figures, of all the engineering students enrolling in our colleges, only 40% ultimately graduate, representing a mortality of 60% within the engineering schools. There is further mortality, or dropping from the profession, during the early years after graduation, so that at any time only about 55% of the living engineering graduates are found remaining in engineering work, and this percentage is progressively diminishing. With few exceptions, all of this represents a tragic waste of economic and human values. If the present rate of enrollment in the engineering schools is not drastically reduced, it is estimated that by 1960 there will be over 400,000 living engineering graduates. Assuming that engineering work can then be found for 200,000 of them, this will leave an excess of over 200,000. This surplus will be either unemployed or otherwise crowded out of the profession. Even in normal times, there are plenty of recent graduates begging for jobs in engineering offices, even without salary. Thousands of those who graduate in engineering are unable to gain a foothold or to retain it in the struggle for economic survival. In hard times, only about one graduate out of every three can find an engineering job.

The Work of the Engineer—Popular fiction and movies have created a misleading picture of glamor and drama in the work of the engineer. Reduced to cold facts, however, it is found that the work of the engineer is quite prosiac, and frequently of repetitive routine. Figures, calculations, formulas, tabulations, drafting, tests, contracts, inspection, estimates, reports, and more calculations,—these make up the bulk of engineering work. Engagements and compensation are limited by the throat-cutting competition of the unscrupulous and the less competent. Credit and honor are scant, and responsibility is heavy. A single serious mistake of arithmetic, drafting, or judgment will wreck an engineer's career.

Conclusion—For additional copies of this article or for any additional information desired concerning "Engineering as a Career," apply to the nearest local Chapter or State Society of the National Society of Professional Engineers.

RESOLUTIONS

Adopted at Fourth Annual Convention of the National Society of Professional Engineers in Pittsburgh, Pennsylvania, October 17, 18 and 19

RESOLUTION NO. 1

Policy of N.S.P.E. Concerning Student Enrollment

Be it Resolved, by the National Society of Professional Engineers in Convention assembled at Pittsburgh, Pa., on October 19, 1938, that the following is the affirmed policy of the Society concerning student enrollment in the engineering schools:

1. Although it believes that the engineering schools are enrolling and turning out prospective engineers in numbers beyond the capacity of the profession to absorb, the National Society of Professional Engineers is not asking for any arbitrary limitation of the number of students admitted to the engineering schools.

2. The National Society of Professional Engineers does advocate and urge quality selection of prospective engineering students on the basis of superior preparation and aptitude.

3. The National Society of Professional Engineers does advocate and urge a progressive raising of the level of qualifications for admission.

RESOLUTION NO. 2

Student Guidance

Whereas, All maladjustment is destructive to the well-being of society;

Whereas, The misdirection of young men into a profession in which they are subsequently unable to gain or retain a foothold is a waste of human values and a crime against the young men, against the profession, and against society;

Whereas, The young man considering engineering as a future career is entitled to receive from the profession the best possible factual information, guidance, and advice uninfluenced by interests seeking to promote student enrollment, and

Whereas, Common humanity demands that we do what we can to save the heartbreak and disillusionment of young graduates and the hopelessness and despair of older men who find professional employment precarious, underpaid, or unobtainable—

Therefore Be It Resolved, by the National Society of Professional Engineers in Convention assembled at Pittsburgh, Pa. on October 19, 1938,—That the National Society of Professional Engineers deplores and repudiates alluring and misleading propaganda heretofore placed before prospective students by agencies interested in promoting and stimulating increased enrollment in the engineering schools; and

Be It Further Resolved—That the National Society of Professional Engineers shall henceforth sponsor, and make available to prospective students, disinterested guidance information presenting an objective picture of what is in store for the prospective engineering graduate, as recorded by those working in the profession and not as rosily painted by those who are sheltered from the economic struggle.

RESOLUTION NO. 3

Cultural Preparation for Engineering as a Career

Whereas, The engineer can no longer remain a silent cog in the machinery of a society which cannot exist and advance without him;

Whereas, The engineer must be articulate and capable of contending on an equal basis with the representatives of business and the other professions in helping to direct community progress and the affairs of government;

Whereas, The highest interests of public welfare and safety are not best served by men whose schooling has been confined and limited to the technical without the development of social perspective, character, and intellectual breadth through an adequate foundation of liberal and cultural education.

Whereas, The content of engineering knowledge now available and required for practice in any one branch of the engineering profession has grown enormously during a generation, or since a century, ago and has become too much to crowd into a four-year course, particularly if the curriculum has to make up for deficiencies of high school preparation besides covering any cultural, economics, or English courses;

Whereas, The present inadequate preparation of entering students, lacking in many instances even such obvious elementary requirements as High School physics, results in a deplorable waste of time and retardation of progress in the professional schools;

Whereas, The other learned professions have progressed toward a solution of problems by requiring two to four years of study at a college of liberal arts before admission to the professional school;

Whereas, Practically all medical schools and the leading law schools have already been established on a graduate level, with college graduation as a prerequisition for admission to the professional school, and in 43 of the States, premedical college study of two, three or four years before admission to a medical school is required by law; and

Whereas, This society is committed to a program of enhancing the professional status of the engineer and, to this end, believes that the engineering profession should be second to none in cultural and technical preparation and equipment.

Therefore Be It Resolved, by the National Society of Professional Engineers in Convention assembled at Pittsburgh, Pa., on October 19, 1938,—That the National Society favors and advocates the raising of the standard of engineering education to a higher level by requiring at least two years of pre-engineering college training as a prerequisite for admission to the engineering schools; and

Be it Further Resolved—That the National Society of Professional Engineers shall do what it can to encourage and speed the attainment of this objective, through persuasion, education, and legislation.

RESOLUTION NO. 4

Works Progress Administration

Whereas, the Works Progress Administration has engaged in a laudable endeavor to extend employment through worthy projects during depression periods; and

Whereas, in some instances, projects normally requiring competent engineering, planning and supervision have been manned by inexperienced and incompetent individuals; and,

Whereas, the sub-standard salaries paid during the emergency conditions tend in some jurisdictions to become the established norm,

Therefore, Be It Resolved, by the National Society of Professional Engineers, in convention assembled at Pittsburgh, Pa., this 19th day of October 1938, that the Works Progress Administration be requested to establish definite standards of engineering requirements for its various categories of work to be performed, that it insist upon compliance with these standards, and that fair salaries commensurate with these standards be adopted and enforced, and that all Engineers in responsible charge of work in States having a Registration Law, be Registered Professional Engineers; and be it further

Resolved, that a copy of this resolution be sent to the President of the United States and the Director of Works Progress Administration.

REPORT OF THE LEGISLATIVE COMMITTEE 1937 - 1938

The past year being an even year, few of the legislatures met. Hence there has not been much legislation to report. Yet, excellent progress has been made.

Two states passed registration acts and three have revised their laws. There are now 40 states and 3 possessions which have registration acts. Nine more to go. Several states are preparing registration acts and it is also heartening to see that the states which have classifications are eliminating these by adopting an act which closely follows the revised Model Law.

Kentucky: Kentucky passed a new Act on March 11, 1938 which is known as the "Engineering Act of 1938." This Act follows closely the Model Law.

Rhode Island: Rhode Island also passed a registration act effective April 23, 1938 which also follows closely the revised Model Law.

Louisiana: The Louisiana Engineering Society introduced to the Legislature a Joint Engineering Registration Act on May 19, 1938. Louisiana already has an act which registers Civil Engineers only. The new act was objected to by many engineers and as a result, it was withdrawn and is dead for the present session of the Legislature.

Michigan: The Act which was revised in 1937 and included Architects became effective January 1, 1938.

Missouri: The engineers of Missouri have prepared an Act which closely follows the Model Law and have organized to submit this Act to their legislature which meets the coming year. There is every indication that this Act will be passed.

New Jersey: New Jersey revised its Act and eliminated classifications. The Act now closely follows the revised Model Law and became effective June 14, 1938 and is known as Chapter 342—Laws of 1938.

Pennsylvania: In Pennsylvania no laws were passed, but a number of important decisions were rendered by the various courts. On appeal, the State Board which had revoked the license of one George W. Scutt was sustained by the Court of Common Pleas on the grounds that Scutt had practiced fraud and deceit in obtaining a certificate in 1930. Since there is no appeal to the Supreme Court, this decision is final. The Pittsburgh Chapter has instituted proceedings against one J. Frederick Triggs, who was appointed Chief Engineer of the City Planning Commission of Pittsburgh, although he was not a registered engineer. Both criminal and equity proceedings were started, but are not yet terminated. Hence the results cannot be reported.

An important case which was decided by the State Supreme Court, that of *Neill v. Gimbel Brothers,* involved the Optometrists whose act is similar to the Engineering Registration Act. In this case, various department stores were enjoined from practicing Optometry, the Court saying that such store or corporation could not practice a profession and further held that "a licensed practitioner of a profession may not lawfully practice his profession as the servant of an unlicensed person or a corporation, and if he does so, the unlicensed person or corporation employing him is guilty of practicing the profession without a license."

In several undertaker cases similar rulings were laid down and in one case an undertaker's license was revoked where the undertaker did not prepare the body properly after a post-mortem and he gave false answers in application for state burial. His license was revoked for "gross incompetency, negligence and misconduct in the carrying on of such business or profession."

Oklahoma: The Supreme Court in that state in the case of *Garman v. State Board for Registration of Professional Engineers* upheld the Board in its refusal to license an applicant who was not properly qualified and did not have sufficient experience.

Virginia: This State too revised its Act which became effective June 20, 1938 and included architects and surveyors.

Washington: The Registration Act of this State became effective January 1, 1938. Request for interpretation of this Act was forwarded to the Committee with regard to the Grandfather Clause and certain classes of engineers. In due course, this interpretation was supplied.

District of Columbia: The Act submitted to the last Congress with regard to registration died in committee. However, your committee has been assured by several members of the District Committee of Congress that if an Act is introduced which is satisfactory to the engineers of Washington, it will be approved by the District Engineer and will pass Congress.

Thanks to the efforts of the engineers and accountants, the O'Toole bill which would only permit lawyers to practice before congressional committees and governmental bodies was killed in committee.

Since the legislature of nearly every state where there are no registration laws meet during the coming year, efforts should be made to organize committees, crystallize opinions of the engineers and have ready to introduce a registration act as soon as the legislature meets. Then, of course, an intensive campaign should be launched and success will be assured, as your reporter feels certain no state would like to be the last one to require registration.

In conclusion, I can report that much progress has been made and the thanks of this society is due to the members of this committee for their loyal efforts. Your committee wishes also to thank President Arthur V. Sheridan, Past-President Dr. D. B. Steinman, and the Executive Secretary, Willard S. Conlon, for their continued co-operation during the past year.

Respectfully Submitted,

SAMUEL I. SACKS, *Chairman*

Legislative Committee

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY THE ACT OF CONGRESS OF AUGUST 24, 1912,

Of American Engineer published monthly at Harrisburg, Pennsylvania for September 26, 1938.

District of Columbia ss:

Before me, a Notary Public in and for the State and county aforesaid, personally appeared Willard S. Conlon, who having been duly sworn according to law, deposes and says that he is the Business Manager of the American Engineer and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Name of—	Post Office address—
Publisher National Society of Professional Engineers,	National Press Bldg., Washington, D. C.
Editor Robert Hall Craig,	222 North Third St., Harrisburg, Pa.
Managing Editor	
Business Managers Willard S. Conlon,	National Press Bldg., Washington, D. C.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address, as well as those of each individual member, must be given.)

National Society of Professional Engineers

A non-profit organization, having no bonds or stockholders

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: (If there are none, so state.)

None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

5. That the average number of copies of each issue of this publication sold or distributed, through the mails or otherwise, to paid subscribers during the six months preceding the date shown above is ..... (This information is required from daily publications only.)

Willard S. Conlon.

Sworn to and subscribed before me this 27th day of September, 1938.

[SEAL] Thomas Durant.

(My commission expires August 16, 1942.)

President ARTHUR V. SHERIDAN's Address at the Convention Banquet

Dean Holbrook, Guests of Honor, Ladies and Gentlemen:

At the outset, I should like to take advantage of the occasion to express my personal appreciation of the courtesy and the hospitality that have been shown by the people of Pittsburgh.

In fact, so attractive has Pittsburgh been that personally I was inclined to seek an occasion to return. The occasion was not difficult to find. A week from this coming Saturday, what is generally conceded to be New York's Best is coming to Pittsburgh to engage, as I thought, in gentlemanly combat with what is considered to be Pittsburgh's Pride.

Referring to the matter, everybody that I met said, "Well, you won't see anything similar to what has happened heretofore. This time it is in Pittsburgh, and there is no question concerning the result." In fact, your very kindly and lovable Dean at the dinner table nodded his head when I said to him such seemed to be the consensus. Feeling that after all he was an Engineer, and that perhaps a little more tolerance might be found in a wearer of the cloth, I turned to the President of Duquesne University admitting to him that I came from New York, and while I was not a son of Fordham the pride of local possession was sufficient to justify hope, at least. In the light of his calling, one might expect that his reply would be along the lines of, "Have faith, my son."

However, that was not his answer. He said, "Pittsburgh will win by at least two or three touchdowns—and that is as it should be."

Well,—Since that I have grown dubious, I have seen bull fights in Spain and in Mexico, and I have walked out. I am afraid I am a bit chickenhearted, I certainly do not wish to come to Pittsburgh merely to see the Ram laid as a sacrifice on the altar of Pittsburgh prestige.

This afternoon, the incoming president made a statement that gave me a suggestion as to how to approach my remarks for this occasion. He referred to the assumption of authority and the ability to wear the mantle of leadership. Inasmuch as he is about to assume it, and I am about to pass it to him, I thought it might be well for me to say what I had on my mind before it was too late.

In discarding the mantle of leadership, one can with more freedom, though perhaps with less effect, comment upon the affairs within a profession, and particularly upon the conduct of an office which he is about to relinquish. Seemingly the role of the philosopher, or rather the desire for the role of the philosopher, increases with age and with service, and, if my remarks need explanation I trust that this urge will serve as an extenuation.

The immortal Bard of Avon has very aptly said that,

"The evil that men do lives after them.
The good is oft interred with their bones."

So let it be with Sheridan. Aye, with Steinman too,—and one day perhaps with Ford, and with his successors. For despite effort or progress, failure or success, it is reasonable to believe that each in turn will leave to his successor a task unfinished, an objective still lacking something of that consummation devoutly to be wished. The role of leadership, which devolves upon Perry Ford will, despite its honor and significance, probably offer him many occasions wherein the requirements of patience and sacrifice will be called upon to test a man's fortitude, and—in a measure his faith in human nature.

Something more than twelve years has elapsed since the Professional Engineering movement was launched in the states of New Jersey and New York. For those who have witnessed the inception and the expansion of this movement from these two states to a Nation-wide influence there has ever been present ample evidence of a provincialism and of an inertia which seem from time immemorial to have circumscribed the social perspective of those who in general comprise the Profession of Engineering. The speaker would venture the opinion that unwillingness on the part of the individual engineer to subordinate personal ambition has ever been the greatest obstacle to the achievement of individual aspiration and to the attainment of a status to which all human beings, including engineers, naturally aspire.

The question of individual opinion and the sanctity of individual thought and endeavor have ever been paramount considerations in the pioneering development of this Nation. One of the previous speakers has referred to the fact that pioneers are frequently misunderstood, misinterpreted, and their efforts seldom recognized as unselfish endeavor. To be specific, the question of the status of the Professional Engineer has been, and still is, a matter of controversy within the profession itself. The National Society hopes to reconcile some of the conflicting opinions.

The practice of licensing practitioners of a particular calling has been the accepted means of designating a professional man for a great many years. No one contends that this is an ideal, or even the best means of according professional recognition. Some of us do submit, however, that is the only practicable method that has yet been attempted.

The National Society and its confederated State Organizations regard the licensing machinery as the one agency that can reasonably assure society of an Engineer whose character and whose professional and social qualifications have been so examined and investigated as to justify according him a status, a recognition, and a prestige without which he cannot hope to assume a role of leadership in the civilization for which he is so largely responsible.

The National Society proposes an effort to humanize Engineering, to effect a liaison between the public and the profession, and to educate the former to a better understanding of, and an appreciation for, the contributions and the necessity of the Engineer to society.

The society in which we find ourselves is highly integrated, complex, and superficially intelligent. Apparently, however, it is not able to reconcile, or harmonize the most fundamental human opinions. There are abroad today in the world various philosophies, ideals if you wish to call them such, and propaganda, that come within the scope of a so-called learning,—which are becoming more widely disseminated and diffused every day.

We find in Russia one philosophy, in Germany another, in Italy another, in France another,—in the Orient, India, China, and Japan, still others, each different from the other. Even America contributes to the potpourri which is leading mankind toward what? Order? I regret to say it appears to be chaos. I say this with due respect to the members of the profession of education. One has heard it frequently stated that the cure for the social, economic, and political maladjustments, of society is more education. At the risk of the imputation of egotism, I humbly submit that in my opinion more education in its present form is not the cure-all or the panacea for the ills that beset mankind.

You would probably find the now generally discarded—thank Heaven—expression I. Q. and various other so called intelligentsia criteria, such as the average education of the entire people of a nation—Where? In the very countries that are manifesting the greatest intolerance toward the rights and opinions of other peoples. Personally, I venture the belief that our present civilization is in need of a spiritual leavening and greater understanding of, and interest in, the physical discoveries and inventions of men.

The value of the spiritual is too obvious to deserve comment from one so unqualified as myself.

However, there is reason to believe that some reflection will disclose that mankind is all too willing and ready to accept for use mechanical and material things without the slightest interest in, concern for or understanding of, causes and effects. It is reasonable to believe that a person possessed of a knowledge of mechanics would under ordinary circumstances utilize the automobile and the airplane in a manner that would indicate a better control and a greater prevention against abuse than one lacking such knowledge. Personally, I am of the opinion that a certain amount of definite scientific and mechanical knowledge is far more essential to the conduct of a mechanical civilization than the utmost familiarity with the various social, economic philosophical ologies and isms that are being abortively attempted throughout the world.

The civilization in which we find ourselves is one, whether we like it or not, premised on science and engineering, and unless the Scientist and the Engineer are encouraged—permitted might be the better word—to take an interest in the administration of human affairs, it is difficult to believe that this civilization can prosper and endure. We must admit that the Engineer will manifest all the weaknesses and the frailties of the rest of mankind, but at least he starts with some concrete realization of what might happen in the case of a cataclysm in a world filled with wars and rumors of wars. Would that he might appreciate the anomaly as in the case of the North and the South three quarters of a century ago, of brother against brother, each contributing what God has given him, to what purpose? The perpetuation of mankind? No, its destruction. Regardless of individual opinion the Engineer will be compelled to subscribe to mob psychology or to the dictates of those who command.

Do not think for a moment that I am subscribing to a brotherhood of Engineers. I am not of the opinion that any International is very practical regardless of how attractive it may appear in theory.

History records a sequence of ages or dominating influences and orders. We first find an age wherein superstition and a pagan priestcraft controlled. Later we find an epoch wherein might becomes right, symbolized by the soldier and the Roman Empire. Succeeding this came a rebirth of learning, and an attempt to disseminate that learning, bringing with it a development which

made man believe that neither God nor universal purpose intended political or economic slavery for the individual. This age was dominated first by the clergy, then by lawmakers and toward its unhappy end, by financiers.

Today, society stands on the threshold of another civilization, a civilization wherein science and engineering, invention and discovery will direct its course whether we wish or not. In order that you might not think this a narrow engineering viewpoint, let me assure you that no less a person than the President of the United States as well as Boake Carter, the well-known commentator, has stated that the Engineer must begin to realize not alone his opportunities, but his responsibilities to the civilization which will shortly be dominated by him.

It is toward the thought expressed by these men that this Society is directing its aims. It is toward the development of a broader understanding, a better appreciation of intangible things, of the humanities, of the frailties of mankind and of the inability to reconcile individual opinions, that the Engineer must point himself if he is going to fill the role which destiny seems to have assigned to him.

While inspired with hope, I trust that I am not prone to undue exaggerations. I believe a review of its history will reveal that no movement on the part of any profession over a similar period of time, and certainly not all the accumulated efforts of other engineering groups over an indefinite period of time, can be compared in accomplishment with those of the National and State Professional Engineer Societies. Scarcely a dozen years old in New York and New Jersey, half of that in Pennsylvania and Ohio, still less in Oklahoma and Texas and other commonwealths, it is already the recognized representative of the profession in those states, where it is the guardian of existing laws, the sponsor of new legislation, and the ever-watchful protection against measures inimical to public and to professional welfare.

The National Society itself is but four years old, and during this period practically half the states of the Union ranging from Massachusetts to Texas, and from Virginia to California and the state of Washington, have voluntarily affiliated with the movement. Others are in process of organization. The National Society is the only nation-wide Engineering organization in this country, and there never has been one before, that has the slightest right to term itself a professional body. Its members are exclusively persons granted the right to practice a particular profession by the laws of the several states. It recognizes no castes, no classes. There are no grades. All of its members are entitled alike to the distinctions, the privileges and, I should say also, the responsibilities of a professional man.

This does not indicate any lack of interest in the junior or the associate. In many instances, more has been done to help such groups socially and economically by the state society than by any other organization. It hopes to aid and assist such persons to qualify before the law for the right to practice and the privilege of membership in this organization. It is primarily dedicated, so far as is possible, to the minimizing of charlatanism and chicanery within the ranks itself, and to this end I hope personally that it will rededicate itself with increasing fervor at every annual convention.

I would suggest that these aims in no manner conflict with the activities of the great National Technical Societies which have contributed so much to Engineering as an art and as an applied science. The National Society encourages membership in these organizations. Practically all of its members belong to one or more of the so-called founder societies. However, sight must not be lost of the fact that these societies have unhappily disunited the profession by recognizing specialities to the extent that the ordinary person believes that Civil Engineering, Mechanical Engineering, and Electrical Engineering are different professions instead of specialties and branches of one calling. Furthermore, such organizations have ignored the social concept necessary to accomplishment in social and professional activities. They have failed to realize the necessity for paralleling in endeavor and in function the form of the Government of this country, in moving from county to state and from state to the Nation.

If something is not done to protect the body of the profession, the mortal coil if you will, society may one day find that the contributions of science and technology will prove as futile as the testimony of a witness without the corpus delicti before a court of law.

In closing, let me suggest that Engineering is a calling with a history and a tradition that justifies a pardonable pride in its accomplishments. The speaker would venture the opinion with all deference to the Cloth, because he yields to no man as a Deist, that the very premises of engineering draw men closer to the divinely ordained purpose of the Great Engineer of the universe than do, perhaps, those of any other single calling, and that this very thing should inspire the Engineer not only with a desire to excel in the practice of his calling, but in an appreciation of the esthetic, the cultural and harmonious, so badly needed in the disordered world of today that descend directly from the superior intelligence of a Creator to the more limited intellect of a creature. Let then the Engineer take his place among the leaders of human endeavor. Let him identify himself more closely with the affairs of mankind. Let him seek to be equally useful as a citizen and as an engineer. Aye, let him vie with the Athenians of old who surpassed in sculpture and architecture, but whose claim to fame rests as securely on the culture of Plato, Aristotle, and Aristophenes, as it does upon the Parthenon, the Atheneum and the Acropolis. Let him above all avoid the intolerance of learning and keep ever in mind the immortal lines:

"There are more things in Heaven and earth Horatio,
Than are ever dreamed of in your philosophy."

HARRY ARTHUR HOPF, NEW YORK MEMBER, IS HONORED

At the conclusion of the sessions of the *Seventh International Management Congress,* held in Washington during the fourth week of September and attended by nearly two thousand delegates from seventeen countries, *the* GOLD MEDAL of the INTERNATIONAL COMMITTEE OF SCIENTIFIC MANAGEMENT was awarded to Harry Arthur Hopf, for outstanding services in furthering the management movement in this country and abroad. In citing Mr. Hopf for this honor, it was stated that "in a very real sense he is one of the pilgrim fathers in the international management movement."

Mr. Hopf was a member of the American delegation to the First International Management Congress held in Prague, Czecho-Slovakia, in 1924, and since that time has actively participated in the majority of these congresses, which have been held triennially. At the Sixth Congress, held in London in 1935, Mr. Hopf headed the American delegation and was the official representative of the United States.

Mr. Hopf is the Senior Member of H. A. Hopf and Company, Management Engineers of New York, and President of the Hopf Institute of Management. His contributions to American and foreign literature in his field of professional effort have been widely recognized as authoritative. In 1929, he was honored by the Czecho-Slovakian Government, which made him an honorary member of its foremost scientific organization, the Masaryk Academy.

In the past fourteen years the Medal of the International Committee has been presented to only three other individuals: Henri Chatelier, of France; Charles Adamiecki, of Poland, and Edmund Laudauer, of Belgium. Mr. Hopf is the first American to receive it.

Engineer Hopf is a member of the New York State Society of Professional Engineers, Inc., and the National Society of Professional Engineers.

CONGRATULATIONS!

John L. Hayner, formerly Structural Engineer for the Bass Foundry & Machine Co., of Fort Wayne, Indiana, has become President of the Fort Wayne Structural Steel Company, a new firm which has taken over the Bass Foundry interest in steel fabricating and the warehouse steel business.

Mr. Hayner is a member of the Anthony Wayne Chapter of the Indiana Society of Professional Engineers.

President-Elect PERRY T. FORD'S Address at the Convention Banquet

Distinguished Guests, Fellow Engineers, Ladies and Gentlemen:

I stand before you tonight rather awe inspired under the realization and the conviction that the mantle that has fallen from the shoulders of Dr. Steinman and Arthur Sheridan to my weak frame carries with it a responsibility that staggers me in its concept.

I want to take this opportunity to express my personal appreciation for the splendid work that the various Committees in this city have been doing, and will yet continue to do in the interest of this Cause. I have known many of them personally for many years. When it became known that Sam Eckels, as we call him, was to be chairman of this convention, I immediately cast the predication that this would be a splendid affair.

I want also to take this opportunity of expressing and to extend to this state the greetings from Ohio. I can recall that not very long ago I was in this city and I began to lament the fact that the date had been set at this time, my reason being that I thought it would be a splendid thing to have it set forward a couple of weeks in order that we might attend the World Series. Being disappointed in that respect, we immediately started out to correct that condition for another year. I am, of course, not at liberty to say that the next convention is going to be held at Cincinnati, Ohio.

This movement that is gripping the majority of the engineers of this country is not new. We submit that it has been smouldering in the breasts of all engineers for years and years, and never did they have the opportunity to so coordinate their efforts and interests to a point where they might point with pride and hold out certain ideals.

It has been definitely and very lucidly illustrated to you that some of the reasons for the chaotic conditions of this country was the fact that the Civil Engineer pursued his way, the Mechanical Engineer pursued his way, and still the Mining Engineer his, and each of them stressing the technical advancement of their particular branches and all of them losing sight of the humanities of all.

I am not concerned whether you are a Civil Engineer or a Mechanical Engineer, but I am concerned in establishing the fact that if you are either, you men have something in common, and that is your professional existence. Therefore, the National Society of Professional Engineers seeks to develop a group consciousness the like of which we submit has not been paralleled in this country.

In order to be an engineer you have had to delve rather deeply into the sciences and in mathematics in order that you might arrive at conclusions that are not false. That enables you to make the most splendid contribution to humanity, to serve everywhere, to bring order out of chaos, and the Engineer is the best man fitted for that task and yet, the public has not in times past properly acquitted the engineer for the services he has rendered.

You go to your water spigot and turn on your water with the firm conviction that it is safe to drink and that it will be there in abundance, and you turn on your radio without giving heed to the things that made it possible. The many daily tasks that are performed by all of our citizenry are directly the product of mathematical deduction and can safely be placed in the hands of our profession for its origin. I do not want to take up your time. I want to close by stating that there is one way only that this idea can be properly pursued.

It means a membership belief in the tenets, that is, your local, your state, and your National societies. The ideals and ideas that come to us from time to time must be found by one or all of them. In the development of your group consciousness you cannot circumscribe it with a political boundary line. There is no extent to which that may not spread within the borders of the Nation in which we live. Therefore, in the coming year, I ask you to give your talents and time in order that we might absorb these groups that would seek to break down our professional designation. It might entail the giving up of some of your pet ideas, and I want to enjoin you to this idea that in the main, the group decision will be right, and he who subscribes to the group decision gives well of his services.

EDITORIAL CONTRIBUTIONS

ARCHITECTS AND, NOT VERSUS, ENGINEERS

We once heard Walter H. Thomas, noted Philadelphia Architect, for many years Director of The Philadelphia City Planning Commission, say that an Engineer is one who learns more and more about less and less until he knows everything about nothing; while an Architect is one who learns less and less about more and more until he knows nothing about everything.

That being true, it is readily seen that there is a community of interest as between these two great professions. Basically, their ethics and professional interests are somewhat similar and closely interrelated. Collective action of the two groups in mutual interest on an increasing scale is, therefore, a vital necessity.

One of the major objectives of this Pittsburgh Chapter, and of this Society of Professional Engineers, is to bring about a closer alliance with Architects and to effect a working agreement in a common cause. To this end the ground work was well laid at the Fourth Annual Convention of the National Society of Professional Engineers which was held in Pittsburgh in October. It is hoped that substantial progress can be reported at the Fifth Annual Convention.

It is our observation that Architects, as a whole, are probably a little more civic-minded and slightly more inclined to devote their energy to cooperative action than are Engineers. If Architects are fair-minded, and we have always found them to be so, they will readily agree that there are many problems, facing the two professions which call for collective action.

This objective is a worthy one. It should be pursued to a successful conclusion.

EARL DWIGHT COVELL

Reprint from The Pittsburgh Engineer

IMPROVEMENT THROUGH ORGANIZATION

Doubtless many reasons may be found for the deplorable fact that many capable engineers are to be found all over the country who are not practicing their profession, but are eking out a living as laborers, farmers, low-salaried clerks, and other occupations below the standard called for by their professional training and experience. However, aside from the depression and its attendant ills, the fundamental underlying cause seems to have been lack of effective organization. The public has had no standard upon which to base its consideration of the profession; hence only the few who are outstanding in their accomplishments, or who have been fortunately placed to demonstrate their engineering ability, have arisen to a high place of public esteem. Even the term *engineer* has been used with such broad and indefinite meaning that one is never certain when it refers to a dignified profession.

However, within the past half dozen years a change has been taking place. Nearly all the states in the Union have passed laws requiring registration as a requisite to the practice of engineering. State and national organizations of professional engineers have been formed in the interest of the public and the profession. Uniform laws have been brought about through the activities of such societies; unethical practices have decreased; employment has been fostered for engineers; standards of practice have been established and improved; the profession as a whole has been greatly benefitted. Such are the fruits of organization.

With such results accomplished and new problems to be faced in the future, the benefit of combined efforts cannot be questioned. It is the duty of every professional man to support the organizations that foster his professional welfare. It is unprofessional for him to do otherwise if he is at all active in his practice. First he should lend his support to his local organization, then to that of the state and finally to the national group. In this manner a wholesome unity of purpose and effort results which ultimately will bring the recognition to engineers that they deserve.

Reprint from The Oklahoma Engineer, October 1938

Remarks of E. A. HOLBROOK, Dean of the School of Mines and Engineering, University of Pittsburgh, Acting as Toastmaster at the Convention Banquet October 19th

Mr. President, Members of the National Society and Honored Guests:

Before introducing the several speakers, as Toastmaster this evening, I want to tell you, and especially those whose business has kept them from the meetings of the Convention, that it has been an inspiration to me to take part in the deliberations. Like most of you, I belong to a number of Engineering Societies, and take pleasure in their professional work and, in a friendly way, meeting and discussing technical questions with their members.

I was puzzled when I became a member of this Society of Professional Engineers and first took part in its affairs, to find that the meetings were not concerned with the design of a bridge, or with the strength of steel or with high and low voltage. I know now that we properly leave these technical considerations to our own technical engineering institute. However, you must have felt in the last few years as I feel, that there is something vitally lacking with you in your relations with others of your old and honored profession. Just what this is, you can tell for yourself by observing the workings of the fraternities we know as the American Bar Association, or the American Medical Association, or even the American Association of Architects. They truly are brotherhoods to promote the professional well being of their members, and in turn they elevate and strengthen their whole professional group.

No one has been a greater individualist in his professional work than I. Fifteen years ago no one fought harder in Pennsylvania against State registration of engineers than I did. Gentlemen, I am glad to tell you that I was licked, and that now I have come to the conclusion that State registration of the engineer as a professional hallmark is coming to be the greatest step in our individual professional life. If this is so, then the Society gathered here tonight has begun to fill a need that is tremendously urgent to the engineering profession. This Society bids us all, whether Civil, Mechanical, Electrical, or other engineers, to move forward together with professional pride, with better professional standards, with professional protection that only a group can give us, toward the economic and social recognition that is the right of the engineer in this industrial civilization.

This movement is new. Those of us who are nearing sixty years of age, shrug our shoulders and say, "I got to the top without it; I can get along without it." Certainly you can get along without it, but how about your younger brother developing under 1938 conditions?

It is my work in life to come in contact with a lot of young engineers. I sometimes wished, especially during the depression, that I was Dean of an Engineering School in a little country town where so many engineering graduates of other colleges would not come to talk with me. However, when we have a depression happen in a city like Pittsburgh, and a swarm of young engineers having lost their positions come to my office and tell me their troubles, I realize that it is no protection that this engineer has graduated at College A, which has a great reputation, any more than as though he comes from College B, less well known. I told a prominent engineer about some of these cases, and he replied, "Well, boys from my college are so well prepared technically, that they don't go through that." Let me say that this man is fooling himself in his thinking. You ought to know that, irrespective of his particular college, the young engineering graduate is a pretty strong individual technically, and a pretty weak individual economically, as between the labor unions on one side and mass production of engineering graduates on the other.

I know of one corporation in which every young engineering graduate is cautioned to join a labor union, and of another that is frankly aware that the young engineer will work for 50 cents an hour "to get experience," while the union tradesman, doing an inferior kind of work, gets $1.60 per hour. Then next year there is a new crop of graduates who, in turn, get their experience. One group of thirty young engineers employed in the design room of a certain organization asked me point blank if they should join a labor union and give up the idea of rising as professional men. They felt that the odds were against their getting ahead as individuals. With these things happening around us, there is no use for us old engineers to shrug our shoulders and say, "They will come to the top, if they are any good."

The Engineering profession is getting too big! There are too many men in it! We can't all become well to do consulting engineers. There are thousands who must always be in the rank and file of the profession, and even those who must be, figuratively, hewers of wood and drawers of water. Are we going to make these great groups professionally minded and professionally welded together, or are we going to urge them to join a labor union?

Because we are individualists, are we going to sit idly by, while a certain group in this State is going to Harrisburg to urge legislation detrimental to the whole body of engineers? These things are a lot more important to you and to me than knowing the shearing strength of a rivet! These things must be a part of our life. I tell you in all seriousness, that unless we get professionally minded as an engineering group, and show professional unity, within the next twenty years we will become laregly a group of labor unions.

Perhaps it is not so important which way we go. Personally, I like the professional way. I like the way this Society is taking, and I say to you that these men who for four years have gone ahead and carried the heat and burden of this fight for professional recognition in this country, deserve a vote of gratitude from those of us who mostly have sat in the background and watched. (applause)

I need not call your attention to the fact that pioneers receive mighty little recognition. When Mozart, the great musician, died, he was given a dog's burial. Rembrandt could not sell his paintings. I read the other day of a curious character called Johnny Appleseed, who planted apple seeds on Ohio farms. People laughed at him, and yet the next generation called him blessed.

I say to you from the bottom of my heart, that this group has started a great work. If you and I will get behind it, we can make it the greatest professional work we ever attempted. We can make it the most important thing in Engineering to the engineer of the coming decades.

I am glad to have had this opportunity to tell this group what I feel about professional engineering.

Thank you.

REPORT OF TELLERS TO THE CONVENTION

Gentlemen:

Your Committee appointed to canvass the ballots reports their findings as follows:

For President—Perry T. Ford, Ohio	1250
Scattering	4
For Vice-President (4 elected)—	
John C. Riedel, New York	1254
Sultan G. Cohen, Indiana	1200
J. W. Beretta, Texas	1228
W. C. Bickford, Washington (state)	1237
Scattering	4
For Treasurer—Walter L. Simpson, Washington, D. C.	1233
Ballots Canvassed	1254

Respectfully submitted,

Edward J. Ducey, *Chairman*

Leo H. Cleary — E. F. Weeks

Herman F. Eilers — Charles N. Casten

October 19, 1938

Brief of Report of Executive Secretary and Minutes of Board of Directors Meeting

By **WILLARD S. CONLON**

This report covers the period from January 1 to September 30, 1938. On the latter date there were 6,438 members enrolled in the twenty-three affiliated State Societies of Professional Engineers of N. S. P. E. The entire cost of operation including publication of the AMERICAN ENGINEER, promotion, public relations, expansion, traveling expenses, etc., was $2.78 per member.

In this period the Arkansas, Tennessee and Maryland Societies of Professional Engineers were promoted and organized by N.S.P.E. The secretary traveled 16,000 miles on society business. Over sixty-five thousand pieces of literature were distributed from the Washington office to affiliated state societies and other interested groups, as well as to individual persons, and over 20,000 pieces of mail matter were handled by the office during this period.

Herewith a Brief of the Minutes of the Board of Directors Meeting.

There were twelve states represented at the board of directors meeting. Those present were:

Directors	*State Officers*
President A. V. Sheridan, N. Y.	S. G. Cohen, Indiana
Vice-President Perry T. Ford, Ohio	H. E. Harris, Conn.
	E. Larson, Ohio
Treasurer, W. L. Simpson, D. C.	R. H. Craig, Editor, AM. ENGR., Pa.
Secretary, W. S. Conlon, D. C.	
Director S. I. Sacks, Penna.	A. A. Townsend, Pa.
Director L. C. Smith, Conn.	T. W. Battin, Pa.
Director L. H. Cleary, D. C.	D. B. Steinman, N. Y.
Director D. H. Walker, Indiana	A. E. Roche, N. Y.
Director Geo. F. Randolph, N. J.	F. H. Zurmuhlen, N. Y.
Director R. H. Knipping, Texas and Louisiana	E. F. Fox, N. Y.
Director J. H. Morgan, Illinois	

A number of administrative matters were considered and disposed of by the board. Plans for an extensive membership campaign were formulated. Plans for the expansion of the AMERICAN ENGINEER magazine were developed; and Cincinnati, Ohio, was selected as the next convention city.

The program for promoting a permanent Federal Department of Public Works headed by a professional engineer having cabinet status, previously approved and promoted by N.S.P.E., was given greater impetus by the board, it having given authority to the president to appoint a special committee to handle this program.

Annual Meeting of the National Council of State Boards of Engineering Examiners

AS REPORTED FOR THE AMERICAN ENGINEER

The nineteenth annual convention of the National Council of State Boards of Engineering Examiners was held in Des Moines, Iowa, October 17 and 18, and was attended by delegates from 26 States and representatives of several national engineering societies.

The following officers were elected; for the ensuing year:

President: Dr. Charles F. Scott, of Yale University, New Haven, Connecticut;

Vice-President: Col. A. C. Polk, of Birmingham, Alabama;

Director from Western Zone: Prof. J. H. Dorroh, of Albuquerque, New Mexico;

Director from Southern Zone: Fred E. Rightor, of Austin, Texas.

The officers holding over are: Past-President Prof. S. H. Graf, Corvallis, Oregon; Director from Central Zone, Prof. J. O. Kammerman, Rapid City, South Dakota; Director from Northeast Zone, Col. C. E. Myers, Philadelphia, Pennsylvania. T. Keith Legare of Columbia, South Carolina, was re-elected Executive Secretary for his sixteenth term.

The next annual meeting of the Council will be held in San Francisco in July, 1939.

The Secretary reported that during the past year Rhode Island and Kentucky adopted engineering registration laws, and are now members of the Council. The Council is now composed of 40 Member Boards, 38 States and Hawaii and Porto Rico, representing a total of approximately 60,000 registered professional engineers and land surveyors.

The following resolution was adopted:

"That it be the consensus of the members of the National Council of State Boards of Engineering Examiners that this Council is an advisory and coordinating agency established primarily to assist the State Boards of Registration for Professional Engineers in a more efficient and uniform administration of state registration laws, and that its functions and activities include the certification of engineers, jointly with State Boards, for reciprocal registration in the various states, and the operation of a national clearing house and information bureau for matters pertaining to the legal registration of professional engineers, serving State Boards, state committees, engineering societies, individual engineers and the public."

The following special appointments were made:

One of the representatives of the Council on Engineers' Council for Professional Development, Prof. N. W. Dougherty, of Knoxville, Tennessee. Representing Committee on Examinations on the Committee of National Bureau of Engineering Registration, Mr. L. M. Martin, of Council Bluffs, Iowa. Representing the Northeastern Zone, on the same committee, Prof. W. W. Hodge, of Morgantown, West Virginia.

At the annual banquet, the Secretary gave a brief review of the history of the Council, calling attention to the fact that the Council was organized at a meeting held in Chicago on November 8, 1920, in response to a call issued by the Iowa State Board of Engineering Examiners. L. M. Martin, now Chairman of the Iowa Board, was largely responsible for the organization of the Council. The Council recognized the outstanding services of four pioneer workers in the Council, and presented Distinguished Service Certificates to Louis M. Martin, of Council Bluffs, Iowa; Prof. C. T. Olmsted, of Ann Arbor, Michigan; Col. Paul Doty, of St. Paul, Minnesota; and Dean P. H. Daggett, of New Brunswick, New Jersey.

At the business sessions of the Council, a number of very informative reports were submitted and were followed by interesting discussions.

REGISTRATION BOARD APPOINTED

Governor Chandler has just appointed the Members of the Kentucky State Board of Registration for Professional Engineers. The Board will be composed of the following Professional Engineers all of whom are members of the Kentucky Society of Professional Engineers:

T. H. Cutler, State Highway Engineer, Frankfort
G. T. Howard, Kentucky River Coal Corporation, Lexington
J. R. Kinsella, Consulting Engineer, Newport
E. R. Ronald, Consulting Engineer, Louisville
C. S. Crouse, University of Kentucky, Lexington

In addition, Col. James H. Graham, Dean of the College of Engineering, University of Kentucky, is a member of the Board, ex-officio, by virtue of his position.

The Board will hold its first meeting the early part of next week and will organize and get ready to function at the earliest possible time. As soon as organization is complete and procedure is formulated members will be informed of the proper method to follow in making application for registration.

(Signed) C. S. CROUSE,
Secretary-Treasurer

The Accrediting of Engineering Schools and Its Effect on State Registration of Engineers and the Education of Professional Engineers of the Future

By **PARKER H. DAGGETT, Dean, College of Engineering, Rutgers University**

AN ADDRESS DELIVERED AT THE CONVENTION OF THE NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS, PITTSBURGH, PA., OCTOBER 17, 1938

During the better part of the past three years an appraisal of the work of the engineering schools of the United States has been conducted in a novel way. Within the past 25 years two previous surveys had been made. The first, conducted under the auspices of the Carnegie Foundation for the Advancement of Teaching, resulted in a report published in 1918 by the Foundation. The second was made by a Board of Investigation and Coordination set up by the Society for the Promotion of Engineering Education, with the aid of a generous grant of funds by the Carnegie Corporation. For a period of six years, from 1923 to 1929, a painstaking study of engineering was made, and the two volumes of the report, published in 1930 and 1934, constitute the most thorough and comprehensive survey of higher education that has ever been made.

Neither of these investigations attempted to classify or rate engineering schools. The aim was broader. Thus, the second survey was "directed to a study of the objects of engineering education and the fitness of the present-day curriculum for preparing the student for his profession."

During the period covered by these two surveys, a new element came more and more into the picture. By the time the report of the S.P.E.E. investigation was published, a majority of states had adopted laws for the registration of professional engineers. In some of these laws, graduation from an engineering school approved by the State Board "as of satisfactory standing" was, and still is, "prima facie evidence of qualification for a license to practice as a professional engineer." In all the laws, graduation from an engineering school approved by the Board carries some recognition in lieu of practical experience. In the majority of States, this amounts to four years of credit out of a total of eight years.

A list of accredited engineering schools thus became inevitable and one state early published its own criteria which the schools would have to meet in order to be accredited. A little consideration will show the serious difficulties inherent in the situation. Indeed, a condition of complete chaos easily can be imagined if each State Board undertook by itself to set up criteria for accrediting.

The situation obviously called for a single authoritative body, representative of all agencies involved, capable of setting up a national list of accredited engineering schools which would be universally recognized. Besides the State Boards, the professional societies have an interest in the problem in that credit is given for graduation from an accredited school towards the requirements for corporate membership in these societies. Finally, the engineering schools themselves have a most vital interest.

Fortunately matters came to a head at the time plans for the Engineers' Council for Professional Development were being formulated. The Council not only constituted a body representative of all concerned in the matter of accrediting, but an accrediting program fitted perfectly the broad objective of the Council, namely "to coordinate and promote efforts and aspirations directed toward higher professional standards of education and practice."

The E.C.P.D. Committee on Engineering Schools, immediately after the formal organization of the Council in 1932, began the formulation of a program for accrediting engineering schools. Broad criteria for accrediting were drawn up, the necessary machinery for administering the program was devised and many problems occupied the attention of the committee for more than two years before it was possible actually to start the visits of inspection.

One of the first problems that confronted the E.C.P.D. committee was whether accrediting should be done with reference to the entire institution or with reference to individual curricula. In many respects the accrediting of the institution as a whole would have been much simpler. Since the major use of an accredited list would be by the State Registration Boards, the procedure of these Boards had to be taken into account. Furthermore, it was generally recognized that some institutions have sound curricula in one branch, but inadequate curricula in other branches. After a thorough study of the question, it was decided to accredit by curricula.

This decision immediately raised another problem: "What curricula shall be recognized?" The first proposal was recognize only the five major divisions represented on the Council. Many of the specialized curricula could properly be classified within one of the major divisions, for example, aeronautical engineering in mechanical engineering, petroleum engineering in mining engineering. On the other hand, some curricula so overlapped into two or more of the major fields as to make classification extremely difficult, if not impossible. Others were so specialized that it was not clear that they could properly be called professional engineering.

A little study of the question indicated that it could not be properly solved in that way. Accordingly, it was decided to withhold final decision until the inspections could furnish the committee with more adequate information as to the real nature of these specialized curricula. In the end it was found that many of these curricula could properly be classified as professional engineering, others very definitely could not.

As the plans for carrying out the accrediting program were being formulated, it was quickly decided that a thorough and trustworthy job could only be done by actual inspections of the institutions. One of the opponents of the movement in its early stages argued that it was only necessary to study the catalog of the institution in order to determine its accreditability. Others thought that it could be done solely by means of a questionnaire. Quantitative criteria can of course be easily determined from catalog and questionnaire, but it can be stated categorically, as a result of the experiences of the visiting committees, that neither of these methods would have produced valid results.

Having decided upon personal inspections, the next question was: "How should they be made?" It was quite obvious that both the expense and the time element precluded the use of a single committee to visit all of the more than 150 institutions. Furthermore, the great diversity of curricula made such a committee almost impossible.

The plan of Regional Delegatory Committees of Inspection, with one member of the National Committee acting as chairman in each of the seven Regions, was therefore decided upon. This plan is not ideal, but it has made it possible to accomplish a rather stupendous job in a comparatively short time, and at a minimum cost. Every effort has been made to provide the necessary liaison between Regional Committees so that proper coordination would be obtained.

The present status of the accrediting program is shown in the accompanying tables. Table I gives the results by institutions. E.C.P.D. has already acted upon some 80 per cent of the institutions, and with the Council meeting this Fall, more than 90 per cent of the initial job will have been completed. It is interesting to note that the proportion of engineering schools on the first accredited list is almost the same as the proportion of medical schools on the first accredited list published by the American Medical Association.

Table II shows the proportion of schools accredited unconditionally in all curricula submitted. Even eliminating Chemical Engineering, in which the "mortality" was the highest, and not considering the specialized curricula, the fact that only 54.2 per cent of the institutions were unconditionally accredited in all the major curricula submitted, is significant.

An analysis of the accredited list by curricula is given in Table III. By "limited accrediting" is meant accrediting for a definite time, not more than three years, during which certain improvements must be carried out and aonther visit of inspection made.

It should be evident from these statistics that the committee has not done a perfunctory job. One the contrary, it has had occasion to exercise its discriminative judgment in many difficult and puzzling situations. Behind these statistics lies an interesting story of improved curricula, additions to staff, sorely needed additions to physical facilities not only in laboratory equipment, but new buildings, additional library facilities, and administrative changes, all of which have unquestionably raised the general standards of engineering education in this country.

The effect of this program on state registration of engineers depends primarily on what use is made of the accredited list by the State Boards. If the list is universally adopted by all of the Boards, graduates on non-accredited schools will suffer a handicap of 4 years in the majority of states. In one state the handicap will be 12 years. On the other hand, if individual Boards supplement the list by additions of their own, then much of the work will be undone and much of the stimulus and incentive for improvement will be lost.

As engineering registration grows in strength and importance, as it undoubtedly will, it seems fairly certain that schools which find themselves unable to bring themselves up to the standards of accrediting which have been established will be forced to abandon the field of engineering education, at least in its professional aspect. Indeed, one such school has decided to abandon the field because the cost of placing its engineering departments and curricula on a sound basis was beyond its resources.

As to the education of the professional engineer of the future, the effect of this accrediting program is really corollary to another and much more basic question, namely, "What is to be the objective of engineering education in the future?" It would be presumptuous for the speaker to attempt to answer this question, for to do so not only would imply the possession of a more prophetic vision than he would profess, but, moreover, the ability to decide, ex cathedra, a question which can only be answered by the considered judgment of the whole engineering profession. We may explore the situation a little, however, and point out what appear to be two alternatives between which a choice must eventually be made.

Engineering Education as at present administered in this country, has a dual objective. It must provide a type of education that will be useful alike to the young man who is headed for a strictly professional career as an engineer and to the young man who is destined for quite as useful a career in some field that may be far removed from professional engineering. Between these two extremes lies an extensive twilight zone of jobs for which an engineering training is essential but which are not strictly professional engineering.

Many parents send their sons to an engineering school not for the purpose of having them trained for the engineering profession, but because they believe that the type of training they will receive in these schools is the best possible preparation for life in an engineering age. Experience shows that this belief is well founded in a great many cases. These young men constitute a goodly proportion of the graduates of our engineering schools today. Of those who fail to graduate likewise a sizable proportion consists of young men who can best profit by training of the engineering type, but whose interest in engineering is not sufficiently intense to urge them successfully to undergo the rigid mental discipline demanded in the professional courses. Thus "mortality" in engineering schools is high and it will continue to be high if we are to maintain our standards at the highest level demanded by future professional requirements.

Engineering schools in the past have successfully met this dual objective. They can no doubt continue to meet it successfully in the future, but the task appears likely to become more and more difficult as the standards of professional attainment are raised higher and higher as our knowledge and resources increase. Moreover, it is a somewhat anomalous situation that may not be altogether advantageous from a strictly professional point of view.

The alternative is definitely to increase our standards of professional preparation, reserve our schools of engineering for the strictly professional function of supplying the recruits required by the engineering profession, and lengthen the curriculum to 5 or even 6 years so as to provide for a fuller and more rounded cultural development as well as a more thorough professional training.

Such a move would be costly. It would mean a higher type of education to a fewer number of students. It would mean better prepared and better paid teachers at the professional level than we have now. It would mean fewer schools of engineering and the cost to the individuals of attending these schools would be greater. It would mean, as a concomitance, the amendment of our registration laws to include the recognition of formal engineering education as a requirement for professional recognition as is now the case only in the New York law.

It seems to the speaker that the logic of the situation created by the almost universal adoption of the principles of State Registration of Engineers, points to a more clearly defined professional objective for the engineering school of the future. Indeed, if one studies the rigid restrictions thrown about the use of the title of Engineer by most of the State Registration Laws, it would seem that the objective of the engineering school must eventually become exclusively professional.

If the engineering schools are thus to be strictly professionalized, the needs of the large group of our students, which now constitute what may be called the by-product of professional training, must not be sacrificed. For this group, four-year curricula of the type and order as now exist, must be provided. They should be known as curricula in applied science and might properly be administered in a School of Applied Science. A large number of our present engineering schools might better serve society by definitely adopting this non-professional objective.

By limiting the engineering schools to the strictly professional function the level of professional attainment could unquestionably be raised. Engineers have long sought greater professional recognition. Legal recognition as a profession is now an accomplished fact in all but eight of the states. The day will surely come when legal recognition will be achieved in every state. The degree of recognition which the public generally will give will depend on the level of professional development that the profession actually attains. It cannot be left entirely to the State Boards. It cannot be left entirely to the engineering schools. It is for the engineering profession itself to say what that level shall be.

Annual Report N. Y. State Board of Examiners of Professional Engineers

During the fiscal year ended June 30, 1938 the State Board of Examiners of Professional Engineers and Land Surveyors held 11 meetings extending over a period of 15 days and considered 2497 applications for licenses, of which 348 were rejected, 897 held for written examination, 208 held for further consideration, and 1044 recommended for licenses. This was only 35% of the number of applications considered during the previous fiscal year. An amendment to the law relative to admission and assignment to examinations became effective January 1, 1937 and in order to be considered under the provisions of the old law a great many applications were filed during the last few months of the 1936 calendar year which undoubtedly explains why the Board was called upon to consider over 7000 applications during the previous fiscal year.

Written examinations were held in July 1937 and in February and June 1938. The results of the June 1938 examination are not at this time available and will be included in next years report. At the July 1937 examination 771 candidates appeared and of these 566 were recommended for licenses, 75 were rejected and 130 were held for re-examination in one subject. The results from the February 1938 examination where 390 candidates appeared were 246 recommended for licenses, 52 rejected and 102 held for re-examination in one subject. About 69% of those who tried these two examinations were recommended for licenses which is nearly 10% below the average for the last 3 years where the records show that over 78% of those trying the examinations during those years were successful in passing them. In February 1938 the first examinations under the new plan were given. All candidates were graduates of registered engineering courses and had otherwise met the experience requirement. They were assigned to three examinations. 33 candidates appeared for these examinations and 12 were successful in passing them, 11 failed in one subject and are held for re-examination in that subject and 10 failed in more than one subject. It will be noted that only 37% passed these new examinations which is a much lower percentage than has controlled in previous examinations. It should be kept in mind. however, that in this new examination all candidates were held for 3 examinations while in previous years the greater percentage of the candidates were held for only the one examination in structural planning and design.

The latest examination for applicants whose applications were filed prior to January 1, 1937 was given in June of 1938. Of these candidates those who failed in one or more of the subjects included in the old form of examinations will be re-assigned to appropriate examinations under the new plan.

A change in fiscal policy became effective in July 1, 1937. The gross receipts from all fees are now deposited direct into the State Treasury and the expense involved in the administration of the law is carried in the annual Appropriation Bill. No further attempt will be made to list receipts, expenditures and surplus as has been done in previous annual reports.

(Continued on page 24)

Engineering Advances Through Scientific Research

By LAWRENCE W. BASS, Assistant Director, Mellon Institute, Pittsburgh, Pa.

An Address at the National Society of Professional Engineers Convention

During a period of less than two centuries a new force has been contributed to civilization through the evolution of the professional engineer. His imprint has been left not only on the physical creations that witness his genius, but has been important in shaping thinking processes into more logical and practical channels.

The engineer has been essential to the development of our industrial civilization. He has had to be a bold character, one who makes use of all available factual information bearing on his problems, but of a self-reliance that will make things go, regardless of the difficulties placed in his way.

As structural and operating problems have become more complicated, the engineer has come to rely on a wide variety of sources for his basic data and information. Then, too, he has felt the necessity of specializing in some selected field. Both these trends will certainly be felt with increasing force in the decades to come.

Contributions of the Physical Sciences to Engineering Knowledge

Among the basic physical sciences which have contributed so richly to engineering progress, chemistry has been an indispensable ally. Through the efforts of the analytical chemist more and more detailed knowledge of the composition and properties of materials of construction and of raw and finished articles of manufacture has been accumulated. The research chemist has evolved new or improved products and processes. The chemical engineer has developed ways and means of producing these materials most effectively on a commercial scale.

Metallurgy and ceramics, two specialized branches of the broader science of chemistry, similarly have contributed along a broad front.

Within the last decade a greatly increased interest in industrial problems has been awakened on the part of the physicist. It is certain that the future will witness many contributions to engineering problems from scientists trained in the field of physics, an activity that is being fostered by the American Institute of Physics.

Economics, too, is destined to take greater cognizance of engineering. But the engineer must foster such linkages with other fields of scholarly endeavor. For example, the chemical industries have been largely overlooked by the professional economist. On the other hand, however, a number of chemists and chemical engineers, feeling that the application of economic concepts to the study of chemical operations is a necessary progressive step, have developed into chemical economists. Because of the specialized language and intrinsic nature of chemical transformations, it is my belief that a thoroughly trained group of chemical economists can best be secured through the superposition of post-graduate study in economics on an under-graduate course in chemical engineering or chemistry. A first step in this direction has been taken through cooperative action of Mellon Institute and the Department of Economics of the University of Pittsburgh by the establishment of a post-graduate fellowship for chemico-economic research.

Similarly, I believe it would be an excellent thing for both engineering and economics if encouragement could be offered to young engineers from various fields to pursue post-graduate work in economics.

It is particularly gratifying to me, as a specialist in chemical economics, to observe the constantly growing appreciation of the humanities which is evident in engineering education in this country in recent years. A most promising example is the recently founded Falk Professorship at Carnegie Institute of Technology in Pittsburgh. The incumbent, Dr. Hotchkiss, has the very appealing opportunity of applying the human sciences and especially sociology in the training of engineers for useful careers.

Criteria of Service

One of the most fruitful fields for cooperation between laboratory scientist and engineer lies in the development of criteria of service and the application of data obtained thereby to the improvement of engineering materials. Such information includes both chemical tests, stressing uniformity of composition, and physical tests, which are concerned with performance of the materials under specified conditions. There exists great need for the development of improved testing procedures. Each new chemical or physical technique, theoretical though it may be in its original application, carries the potentiality of solving some important industrial problem. As an example, one need only mention the x-ray and its application to industrial testing procedures. These new qualitative or quantitative tests are particularly significant if they can be applied in an automatic or semi-automatic manner.

Throughout industry there is a great need for practical service tests, which examine the behavior of materials under conditions simulating those to which the product will be exposed when actually in use. It is particularly difficult to break down the properties required for a given substance into a series of classical tests of one physical or chemical characteristic. Evaluating procedures of this type are essential in most quality control programs, but in many cases it has been found advantageous to supplement them with practical use tests.

Service tests are especially valuable when they are subject to acceleration, i. e., when in a comparatively short time they give an effective measure of the serviceability of the material under actual conditions of use over a much longer period. The development of the paint, varnish, and lacquer industries in the United States, which has come about through chemical research with superb aid from engineering specialists, has been due to a major extent to the devising of effective accelerated testing procedures.

In making a selection of tests, it is apparent that the engineer and the laboratory man must work in close harmony. The former, on the basis of his practical knowledge and experience, must select those properties and combinations of characteristics that represent utility. The laboratory man must choose, from the techniques available to him, those that best measure the selected properties.

The importance that is being attached to this subject is shown by the recent announcement of a series of six courses established at Massachusetts Institute of Technology for the study of the theory and practice of quality control. Particular emphasis is placed on the statistical treatment of control data.

The Engineer in Technical Sales and Service Work

Marked success has attended the employment of engineers and other technicians in sales and service work involving particularly materials of construction, industrial apparatus, and plant equipment, as well as chemicals. Nevertheless, insufficient attention has been given during the educational process to acquainting young men of correct personal qualifications with the opportunities in these fields. More men in such posts should be engineers. More company executives should study their requirements in order to encourage educational efforts to meet them.

It is obvious that technical sales and service work requires a background of data based upon a broad research program. Frequently the available knowledge must be supplemented by special investigations conducted for the purpose of answering specific needs of the customer. Men in this line of work must be equipped not only with a thorough familiarity with their equipment or product but also with a working knowledge of the technology of the industries they are serving.

Competition Among Materials and Methods

Each year finds the engineer in a better position to solve his problems because of new materials and methods that have become available. The number of alloys, plastics, and ceramic materials with properties that fit them for particular uses is constantly increasing. And it is reasonable to expect that the ingenuity of the organic chemist will pave the way to more extensive engineering application of the synthetic resins and other types of carbon compounds.

The availability of many different products or procedures that should be considered for a given engineering purpose will cause the development of more exact economic analysis of this inter-commodity or inter-process competition for use. In other words, the extensive employment of economic balance will be needed to permit the best decision in the selection of constructional material or method, when initial cost, upkeep, operating cost, and replacement value are allowed for. Such analysis of a constructional or operating problem will require continually increasing data on the performance characteristics of the raw materials of the engineer.

Sources of Engineering Data

Many agencies are at work today to provide the engineer with the data which are essential to his activities. Their contributions

to the solution of his problems can be made still more fruitful by closer cooperation. Proper joint analysis of engineering needs will hasten the time when still more useful materials or methods become available.

University laboratories, engineering experiment stations, and government laboratories are conducting much research work of direct interest to the engineer. More than 2500 industrial laboratories are in operation in the United States, employing more than 20,000 technical men, and spending in the neighborhood of $100,000,000 per year. Many trade associations have active research committees and in some cases conduct extensive research programs on industrial problems under their own auspices. There are also several research institutions, such as Mellon Institute, carrying on investigations on a broad range of problems.

The engineer is neglecting opportunities if he does not keep abreast of research progress in the fields of his particular interests. It is not always easy to locate the various sources of information, but the results are usually ample repayment for the effort.

The Rise of Chemical Engineering

The fact that the concepts and principles of the engineer are broadly applicable to all phases of human activity dealing with physical matter is attested by the numerous specialized branches of engineering that have been evolved to meet a corresponding need. We can look forward with confidence to a still more wide-spread application of engineering theory and practice.

The development of chemical engineering in this country is an example of the creation of a specialized group to meet the needs of a growing industry. Contrary to popular impression, the manufacture of chemicals was not an infant enterprise at the beginning of the World War, for the industry was then fourth in size, and its products were valued at $2,000,000,000 per year. Wartime demand for chemicals, caused by restricted imports, stimulated the manufacture of many substances hitherto not made in the United States, and this expansion of the industry has been increasing ever since.

In 1908 a group of far-sighted men became convinced that a new branch of engineering was in evolution in the operations involved in dealing with substances that undergo a change in chemical composition in the course of manufacture. To provide for the needs of this new technical group, they founded the American Institute of Chemical Engineers. The concept that this phase of engineering represented a well-defined field, and was not a hodge-podge of chemistry and engineering, has been well crystallized in the words of Dr. Arthur D. Little:

"Chemical engineering, as distinguished from the aggregate number of subjects comprised in courses of that name, is not a composite of chemistry and mechanical and civil engineering, but itself a branch of engineering, the basis of which is those unit operations which is their proper sequence and coordination constitute a chemical process as conducted on the industrial scale."

On this firm foundation have been designed well balanced courses to equip the chemical engineer for his important role in the manufacturing industries. Not only were new data, but even new types of data required, to enable him to practice his profession. All sources of research information were called upon, and investigators were encouraged to extend and intensify their activities. The result has been an invaluable technical literature, which, incidentally, has been compressed into a handbook of chemical engineering worthy of a place beside the other engineering bibles.

An excellent statement of the status of chemical engineering in 1928, twenty years after the organization of the Institute, was given by Dr. C. M. A. Stine. According to him the penetration of chemical engineering was practically complete in the manufacture of heavy chemicals, fine chemicals, electrochemicals, coal tar products, high explosives, propellent powders, artificial fibers, and synthetic resins. Another group of industries had suffered, or, better, had been blessed by, an engineering penetration of 60-75 per cent, namely: processing of coal, processing of crude oil, wood distillation, sugar refining, large scale preservation of perishable foodstuffs, manufacture of paper, cement and lime, and fertilizers. A third group of process industries had been penetrated by chemical engineering to an extent of 50 per cent or less; manufacture of vegetable oils, ceramics and glass, paint and varnish, soap, leather, textiles, and rubber. It is obvious, of course, that these generalities do not necessarily hold for any particular plant or company, but rather reflect the situation throughout an entire industry.

The decade since Dr. Stine's analysis has seen many changes, and practically throughout the industries he mentions there has been a distinctly greater reliance on the chemical engineer. The trend is particularly apparent in petroleum refining, which has absorbed as high as one-eighth of all chemical engineering graduates in some late years.

Opportunities for the Engineer in the Food Industries

The expansion of the various chemical or process industries was responsible for the development of the chemical engineer. In a similar way, the growth of large-scale food preparing establishments has provided opportunities for engineers, but thus far no group of men trained specifically for this type of work has arisen.

The food industries constitute the largest group of industries with a common purpose. Their products have a factory value of $9,000,000,000 per year and a retail value of $12,500,000,000. These industries include 66 firms classed as national advertisers, 13,000 corporations, and 46,000 plants.

There are, of course, a number of engineers in the food industries, but only a fraction of the number that could be profitably employed. For their particular fields a number of mechanical and electrical engineers have been absorbed and some of these men have naturally broadened their activities into important positions in general operations and executive functions.

Aside from specialized work of a mechanical or electrical engineering nature, the chemical engineer has at present, I believe, the best type of training for the food industries. As has been pointed out by Dr. L. V. Burton, the various food handling processes can be classified into a small number of unit operations, corresponding in a general way to those of chemical engineering.

Until recently there have been, so far as I know, no courses of engineering nature designed to fill this need, though within the last three years a start in this direction has been made in two or three eastern schools. Several courses in special phases of food technology have been in operation for years, but their emphasis has been on quality of product and not on engineering aspects.

Food engineering will prove to be a very difficult field in which to develop a satisfactory curriculum. In addition to the basic sciences and engineering subjects, the food engineer should possess a working knowledge of bacteriology. He should have a practical acquaintance with the requirements of sanitation and public health. He needs training in the principles of nutrition. And, finally, he must be able to have a sympathetic understanding of the psychology of the consumer.

There are on all sides many ways in which the professional position of the engineer in the food industries can be improved. There is no professional organization at the present time which caters uniquely to his needs. There has been, to repeat, no college curriculum to prepare him specifically for his job. There is no organized literature covering the engineering aspects of the food industries in general. Adequate research has not been carried out to provide basic engineering data for his purpose.

Opportunities for the Engineer is Several Other Fields

I have spoken at some length concerning the opportunities for engineers in the chemical industries and in the food industries because of my close contact with these fields. In closing, I must not neglect reference to other lines of work that should be attractive to engineering specialists.

There is, for example, a scarcity of fuel technologists in the United States. I allude to the chemical or mechanical engineers who are versed in the methods of preparing fuels for the market. Fuel technology is no longer a division of mining engineering. As built up especially in England, it has to do with the production of efficient fuels that are marketable, using the materials the mining engineer makes available.

Almost as scarce are combustion engineers. Air conditioning engineering is beginning to receive pedagogic attention. Combustion engineering, however, is still being taught superficially. When there is an opening for a combustion engineer it is a most difficult task, we have found, to locate a properly qualified specialist.

Another opportunity in engineering education is in providing adequate instruction in safety engineering. The further development of industrial hygiene will provide posts for a considerable number of safety engineers.

In developing educational means for training these specialized engineers, the danger of over-specialization of undergraduate curricula should be avoided. A sound policy would appear to be to work out for this purpose a post-graduate period of one or more years to follow one of the established undergraduate courses in engineering. The success that has attended the training of specialists in gas engineering, in petroleum production engineering, and in petroleum refinery technology has demonstrated that, through the colaboration of engineering and the basic sciences, systematic courses of instruction are entirely realizable in specialties of these types.

Hand in hand with the building up of systematic instruction in the fields mentioned above will be the necessity for more

(Continued on page 24)

NEWS OF STATE SOCIETIES

Editor's Note: THE AMERICAN ENGINEER will carry reports of State and Chapter meetings in the issue succeeding their receipt. We must have copy by the 20th of the month preceding the month of issue. Copy received after that date runs the risk of not being on time.

OHIO

PROGRAM FOR COMING YEAR OUTLINED

The Toledo Society of Professional Engineers held its first fall meeting September 20, at which time announcement was made of the officers elected for the year 1938-39. These officers are as follows:

President,	A. S. FORSTER
Vice-President,	K. M. WADDELL
Sec'y-Treas.,	C. E. PETTIS
Chemical Director,	HENRY W. HESS
Civil Director,	CARLETON S. FINKBEINER
Electrical Director,	GIL SOUTHERN
Mechanical Director,	R. M. BATCH
Structural Director,	H. J. WERNERT
Wood County Director,	J. J. WALKER.

At the October 18th meeting, President Forster announced the appointment of committee chairmen and plans were made for the year's work.

The Society is taking an active interest in attempting to secure employment of qualified local engineers for work in connection with extensive improvements in the Toledo Water Works System. A special committee appointed for the purpose has canvassed unemployed engineers to determine their qualifications, with a view to obtaining employment for such as are qualified, either on the engineering staff of the City, or with the Consulting Engineers on the project.

Plans for the coming year include the continuance of an active interest in proposed legislation affecting engineers, as well as efforts toward promoting a greater degree of standardization of licensing and reciprocity.

(Signed) C. E. PETTIS,
Secretary.

THE CLEVELAND ENGINEER

Forum Meeting—Dr. A. B. Dennison, Cleveland Academy of Medicine, "You Must Sell Your Services"; also a sound film "Underground Rain Drops," Thursday, November 17, Case Club, 8 P.M.

PERSONALS

A special committee consisting of Leon Wolford, Chairman, Lancaster, Wendell P. Brown, Cleveland, D. H. Overman, Columbus, and W. F. Peters, Akron, was appointed by the Ohio Society of Professional Engineers to assist their Legislative Committee in the preparation of a bill to adjust the salaries of County Engineers and other officials.

At a recent election both political parties had difficulty finding a candidate for the Engineer's office in a County where the salary is $1,200 per year. In the same County it is necessary to pay the Chief Deputy Engineer $1,650 per year to have the position filled. This deplorable condition affects all Engineers.—ED.

John H. Puzenski succeeds Grayum E. Bing as Chief Draftsman in the Road Engineering Department of the County Engineer's office. Engineer Puzenski has served on several Society committees during the past three years.

William C. Kammerer, delegate from our Society and member of the Board of Direction of Ohio Society of Professional Engineers attended the Board meeting at Columbus, Ohio. The important business at hand was a discussion of the transition from per diem to monthly salary for employees of the State Highway Department as authorized by the recently enacted House Bill No. 893. The State Society by resolution urged that monthly salaries be not less than the Salary Schedule adopted by Ohio Society of Professional Engineers.

Willard C. Lawrence has been appointed Acting Commissioner of Water and Heat of the City of Cleveland Department of Utilities. He succeeds L. A. Quayle, Chief Engineer and Acting Commissioner of Light and Heat since 1935. L. A. Quayle continues his duties as Chief Engineer but relinquishes his duties as Acting Commissioner to give full time to directing the engineering offices on the new municipal light plant expansion program.

REN B. PERRINE

Ren B. Perrine, 65, vice-president and treasurer of George S. Rider Co., died Sept. 27, at Huron Road Hospital after an illness of one year.

He was associated with Van Dorn Iron Works, later was a partner in an architectural firm in Pittsburgh, and since 1918 had been with George S. Rider Co.

He was a member of Cleveland Society of Professional Engineers, Cleveland Engineering Society, American Society of Civil Engineers, Chamber of Commerce, Cleveland Athletic Club, and Pine Ridge Country Club.

Mr. Perrine was for twenty years closely identified with Cleveland's industrial development.

NEW MEMBERS

We welcome into our Society and introduce to the membership the following new members:
L. M. Crampton, 4012 Bluestone Rd., Cleveland Heights.
Thomas O. Dahlstrand, 1295 E. 142d St., East Cleveland.
Russell C. Nevel, 6111 Pelham Dr., Parma.
Henry M. Schnerer, 3222 Clarendon Rd., Cleveland Hgts.
H. S. Stevens, 11841 Lake Ave., Lakewood (Reinstated.)

RECENT NEWSPAPER CLIPPING

From the Philadelphia Evening Ledger

A little note on what happens when the politicians decide they know better than engineers:

Nebraska is the scene of several PWA hydroelectric experiments, for which more than a third of the entire PWA allotments for non-Federal power projects is earmarked. Approximately $25,000,000 has already been spent.

Competent consulting engineers surveyed the projects and reported many impracticalities. Then army engineers doublechecked with similar surveys and also turned in adverse reports.

But the politicians decided the engineers did not know what they are calculating about and went ahead. Two projects have been completed, neither of which has been able to produce a steady flow of reliable firm power.

LA GUARDIA TO TELL NEW YORK SUCCESS

How New York City succeeded in taking control ot its municipal government from political spoilsmen through operation of a workable civil service system will be explained Saturday night when Mayor Fiorello H. La Guardia talks at Masonic Auditorium in support of Cleveland's proposed civil service charter amendment.

Mayor La Guardia will come here as the nation's foremost advocate of the merit plan and as the representative

of a city which claims an all-time, all-American record for elimination of patronage in municipal jobs.

Cleveland Press, 10-24-38.

It is interesting to know that our Public Relations Committee contacted Mayor La Guardia initially and assisted in bringing him to Cleveland for this important meeting.

BOARD OF DIRECTION

The Board of Direction has held three meetings since the publication of the October issue of *The Cleveland Engineer.* Some of the subjects discussed at these meetings are:

1. Two amendments to the constitution—one to create the office of historian; the second to include past presidents in the Board membership so that the Society may benefit by their advice and experience.
2. The Civil Service Amendment—The Board joins with other public-spirited organizations to urge ratification of this amendment.
3. The United Veterans' Hospital—The Board endorses the United Veterans' Hospital Commission in their efforts to have the hospital built in this locality as was originally intended.
4. Amendment to Registration Law—The Resolutions Committee has been instructed to draw up a resolution and forward it to The Ohio Society of Professional Engineers urging that registration, after a period of three to five years, shall be granted only to applicants who successfully pass written examination. Thus we can raise the standards of our profession to compare with those maintained by the Bar and Medical examining boards.
5. Programs—Several interesting proposals by the program committee were discussed. An unusually attractive program for the coming season is assured.
6. Ethics—Upon inquiry from the Cleveland Chamber of Commerce concerning the ethical status of advertising by professional engineers, the Board communicated its views to the Chamber, and has been assured its cooperation.
7. Delegate—President Young was delegated to attend the National convention in Pittsburgh.
8. Membership—In addition to considering the applications of new members, the Board has reinstated a former member who has just returned to Cleveland. Welcome back, Engineer Stevens!

PITTSBURGH CONVENTION

President W. D. Young, our delegate to the fourth annual convention of National Society of Professional Engineers at Pittsburgh, October 17, 18, and 19, was most enthusiastic on his return to Cleveland.

President Young was deeply impressed by the serious thought which the delegates from the State Societies gave to the professional problems at hand, and by the clear, concise arguments Dr. D. B. Steinman put forth in defense of the basic principles underlying the professional engineering organizations.

President Young reports that many compliments were paid our Society and its active membership.

FORUM

This column is available for comments from members and others. All articles must be signed, but if the author requests we will carry his initials or nom de plume.—ED.

July 29, 1938.

We have received Vol. I, No. 1 of *Cleveland Engineer* which we should like to have regularly to keep on file at our library.

We wondered, therefore, if it would be possible for you to add our name to your complimentary mailing list to receive one copy as issued beginning with Vol. I, No. 2.

If you feel that this courtesy can be extended, we shall be very grateful.

L. A. EASTMAN, *Librarian.*
By: L. E. ADAMS, *Order Librarian.*

Under date of August 1, 1938, Secretary Lucas assured Cleveland Public Library that they would be put on the complimentary mailing list.—ED.

We would like to extend our heartiest congratulations to the new *Cleveland Engineer.* We will be very much pleased to receive all future copies in return for our *Lehigh Valley Engineer.*

FRANK NAGY, *Editor,*
Allentown, Pa.

In last month's issue of the AMERICAN ENGINEER, I happened to notice a letter written to you by a manufacturer expressing a desire for closer cooperation with the consulting engineer. This reminder brought home the fact that inadvertently manufacturers frequently do not appreciate that their literature and technical recommendations oftentimes are misapplied. Consumers very often ask manufacturers for engineering recommendations or are guided solely by the manufacturers' technical literature in trying to arrive at a solution to their engineering problems. Very often this causes difficulties which the professional consulting engineer could have avoided had he been consulted initially.

To definitely call attention to the consulting engineer in our various technical publications, we are adopting the use of a tag—"see your consulting engineer." This inscription appearing in our various publications, while it may be helpful, invariably requires the services of a consulting engineer for its proper adaptation and suitability to the particular problem involved.

RICHARD C. LIPPS,
The Trumbull Electric Mfg. Co.,
Plainville, Conn.

Reprinted from American Engineer.

LORAIN COUNTY

The Lorain County Society of Professional Engineers met at Elyria in October, to complete their plans for an organization limited to professional engineers and surveyors living in Lorain County. Lorain County was originally part of Lake Erie Society of Professional Engineers. The Lake Erie Society continues to serve the engineers and surveyors of Huron and Erie Counties.

Officers elected to serve until 1939 are D. E. Patterson, Lorain, President, and R. E. Hollis, Elyria, Secretary.

We look with keen anticipation to close contacts with the Lorain Society of Professional Engineers.

PROGRESS

This will acknowledge with thanks receipt of your letter of July 27th to Mayor Harold H. Burton outlining the recommendations of the Cleveland Society of Professional Engineers with regard to the status of engineers employed by the City of Cleveland.

Mayor Burton is glad to have this set of standards (salary schedule) outlined by you and has referred your letter to a Committee of Directors under the chairmanship of Director Miles E. Evans of the Department of Public Service for study and recommendation.

Mayor Burton appreciates the active interest and cooperation of your organization in city affairs and will welcome your suggestions at any time.

BEN F. FIELD,
Executive Assistant to the Mayor,
In Charge of Public Relations.

SEASON OPENS

Mr. Bennett Chapple, "The Iron Master," Vice-President, American Rolling Mills Co., "Pushed Back the Steel Horizon" before 300 members and guests recently, and with the sound film "Romance of Steel," took us on a tour of inspection of the original continuous strip mill. A dramatic sketch "Sunlight on Steel" by the Shaker Players added a human touch to the meeting.

The inspection trip of the Easterly Sewage Treatment Plant attracted 150 members and guests.

The success of the October meeting speaks well for our aggressive Program Committee.

PENNSYLVANIA

NEW CHAPTER ORGANIZED

MIDWESTERN PENNSYLVANIA'S new Chapter held its first meeting in Grove City, Mercer County, Pa., September 24, and the highlights of business were as follows:

1. Name of Chapter was decided by vote to be MIDWESTERN PENNSYLVANIA Chapter of Pennsylvania Society of Professional Engineers.
2. Committee on Constitution was appointed. The Constitution to be drafted to conform with requirements of State Society and our local.
3. A committee on membership was appointed with an objective of having 40% of the engineers in these counties organized by January 1. All engineers entering before that date to be Charter members.
4. Next meeting to be held in Franklin, the date yet to be decided.

Fred Service, an attorney of Sharon, was guest speaker, giving an inspiring talk on registration and its importance to the public and the engineering profession. For his sincere interest in the engineering profession the Chapter unanimously elected him an honorary member.

Copies of the AMERICAN ENGINEER were distributed.

Charter Members to Date

Aiken, James Claude, 707 N. McKean St., Butler, Pa.; Burnside, Lewis E., City Building, Sharon, Pa.; Butler, Francis M., 511 Winter Ave., New Castle, Pa.; Clepper, Frank, Boyle Building, Sharon, Pa.; Claybaugh, Harry W., 1335 Chestnut St., Franklin, Pa.; Clark, Chas. P., 24 Chambers Ave., Greenville, Pa.; Fleming, J. F., Slippery Rock, Pa.; Gilkey, Thomas A., 407 Green Building, New Castle, Pa.; Greenough, L. C. D., 419 W. Penn St., Butler, Pa.; Gerber, Harry, 640 Middlesex Road, Farrell, Pa.; Graham, Frank P., 1st National Bank Bldg., Grove City, Pa.; Harper, Fred M., City Building, Butler, Pa.; Hopkins, John W., 122 Plum St., Greenville, Pa.; Kinney, Edwin J.; 1440 Chestnut St., Franklin, Pa.; Lamm, Lee L., R. D. No. 8, New Castle. Pa.; McFetridge, William S., 10 North Mains St., reenville, Pa.; Myers, Glenn D., 313 Seventh St., Franklin, Pa.; Milholland, Caleb H., 433 E. Winter Ave., New Castle, Pa.; Niece, Howard, 217 Harvard St., Grove City, Pa.; Street, John, 320 Edgewood Ave., New Castle, Pa.; Stastny, Joseph, 2 Chambers Ave., New Castle, Pa.; Taylor, Silas Jesse, 323 Franklin St., Slippery Rock, Pa.; Wilson, W. Leslie, 106 E. Garfield Ave., New Castle, Pa.

(Signed) JOSEPH STASTNY,
Sec. Treas.

PROFESSIONAL ENGINEERS REGISTERED RECENTLY IN PENNSYLVANIA

Barnes, Philip M., Eichleay Engineering Corporation, 1600 Arch Street, Philadelphia, Pa.; Bowman, Arthur M., 1109 Diamond Bank Building, Pittsburgh, Pa.; Brown, Edward C., House Building, Pittsburgh, Pa.; Carr, Hugh Roderick, 5 Herning Avenue, Cranford, N. J.; Coder, Fred C., 1229 Morningside Avenue, Pittsburgh, Pa.; Ellenberger, Fred D., 1822 West 11th Street, Erie, Pa.; Farrell, Joseph R., 4422 Market Street, Philadelphia, Pa.; Farrington, A. E., 515 Mulberry Street, Hollidaysburg, Pa.; Flesher, William, 112 North 13th Street, Harrisburg, Pa.; Homan, Robert M., 412 Washington Street, Reading, Pa.; Hunter, Earl L., New & Church Streets, Spring City, Pa.; Irwin Kilshaw McHenry, Philadelphia Electric Company, 1000 Chestnut Street, Philadelphia, Pa.; Jackson, J. O., 27 Creighton Avenue, Crafton, Pa.; Meinecke, Heinz, 224 Catalpa Avenue Mt. Lebanon, Pa.; Mitchell, Jay Gordon, 214 Pine Street, Harrisburg, Pa.; Murray, John J., 805 South Braddock Avenue, Pittsburgh, Pa.; Schneider, Edw. F., 3134 Boulinot Street, Philadelphia, Pa.; Timanus, Clarence S., 107 West Linwood Boulevard, Kansas City, Mo.; Twomey, Edward F., 507 Westinghouse Building, Pittsburgh, Pa.; Tynan, Desmond P., Koppers Building, Pittsburgh, Pa.; Wagner, E. L., 55 West 42nd Street, New York City, N. Y.; Weidlein, Wm. D., 509 Glen Arden Drive, Pittsburgh, Pa.; Zieber, W. E., York Ice Machinery Corporation, Roosevelt Avenue, York, Pa.

Surveyors Registered Recently in Pennsylvania

Gray, Vernon W., 23 Congress Street, Bradford, Pa.; Harrison, Leslie J., Blakeslee, Pa.; Leach, Charles F., 113 North Fifth Street, Lemoyne, Pa.; Mahaffey, Philip S., 434 St. Clair Avenue, Clairton, Pa.; Reed, Paul B., 548 Broadway, McKees Rocks, Pa.; Rogers, Donald Heiss, 98 South Sixth Avenue, Coatesville, Pa.; Schaffner, Joseph L., 1338 Taylor Avenue, New Kensington, Pa.; Stepp, W. R., Laporte, Pa.; Taylor, Charles B., 919 City County Building, Pittsburgh, Pa.; Walker, Emerson, 525 Lawrence Avenue, Ellwood City, Pa.; Zerbe, T. W., Zerbe, Pa.; Ziegler, Rudolph K., Bethel, Pa.

PHILADELPHIA CHAPTER

Four of our members registered and were in attendance at the Fourth Annual Convention of the National Society of Professional Engineers and a guest at the banquet, and they reported a very interesting and worthwhile convention and the excellent manner in which the Pittsburgh Chapter managed it.

Engineer George H. Kaithern, Plans Engineer, Pennsylvania Department of Highways, was speaker at our November meeting at the Engineers' Club, November 3d—Topic—"Roosevelt Boulevard Super Highway Improvements."

The discussion which followed lasted until nearly 11 o'clock and was interesting not only from the informational but also from the professional standpoint.

The State has taken over, for improvement and maintenance, 150 miles of city streets—main arteries for through highway traffic.

The Roosevelt Boulevard is 220 feet wide and will have two roadways in each direction separated by an 11 ft. wide grass plot in which the existing rows of trees will not be disturbed. A central strip 80 ft. wide, which is now paved, will be converted into grass plots and contain two rows of existing trees. Hence this improvement will consist of entirely new paving and widening of several bridges.

We were encouraged by the number of visitors present and their interest in our Society.

Plans were proposed for a campaign for new members, and our December meeting is reserved for discussion of the future of our profession. Each member is requested to give the Secretary a list of all registered engineers he has contacted, before our next meeting.

(Signed) Alfred A. Townsend
The Publication Committee

THE PITTSBURGH ENGINEER

Issued Monthly by Publications Committee
EARL DWIGHT COVELL, *Chairman*
NATHAN LEEBOV, *Vice-Chairman*

Chapter Meeting

The regular meeting of this Chapter was held in the Assembly Room, Fort Pitt Hotel, November 17.

New Members-Membership Status

The Chapter welcomes the following engineers to its membership:

Brown, Edward C., 1007 House Bldg., Pittsburgh; Bruggeman, H. W. C., 6119 Hoeveler St., Pittsburgh; Early, Joseph, 407 Peoples East End Bldg., Pittsburgh; Franklin, Phil A., 1123 Termon Ave., Pittsburgh; Gilbert, Melvin A., 3789 East Street, Pittsburgh; Imel, Charles Arthur, Box No. 43, Clarion, Pennsylvania; McCall, Clarence H., P. O. Box 1166, 2700 Gulf Bldg., Pittsburgh; Morehouse, James H., 1103 Illinois Ave., Dormont, Pa.; Murray, John J., 805 S. Braddock Ave., Pittsburgh; Wittmann, John G., Jr., 754 Brookline Blvd., Pittsburgh.

Total Members: 174. Members Transferred: 0.

OBSERVER'S NEWS NOTES

With regret is reported the death of a member of the Pittsburgh Chapter.

ENGINEER N. A. BARNHART

Engineer Barnhart was a Mining Engineer and graduate of Washington and Jefferson College. He is survived by his wife Mrs. N. A. Barnhart, 1306 Ridge Avenue, Pittsburgh, Pennsylvania.

The Pittsburgh District Committee of the A.S.T.M. sponsored a demonstration of modern testing methods, whereby tiny samples of materials can be examined by qualitative analysis of extraordinary sensitivity and by quantitative methods of unusual accuracy, on November 14th in the Mellon Institute Auditorium. The procedure and demonstration was conducted by Dr. Walter R. Kirner, Coal Research Laboratory, Carnegie Institute of Technology, Dr. Gordon H. Stillson, Gulf Research & Development Co., and Dr. E. B. Ashcraft, University of Kansas.

It is well known by those familiar with the Registration Act for Professional Engineers that "A firm, copartnership or corporation may only engage in the practicing of the profession of engineering, in any of its branches, including surveying, in this Commonwealth in the name of the person or persons connected with such firm, copartnership or corporation who is or are in responsible charge of the design, or of the supervision of the work which constitutes such practice each of whom is registered as required by this act." (See Section 8 of the Registration Act.)

It is a cause for jubilation on the part of Professional Engineers that the above requirement of the Registration Act has received just recognition at the hands of the City Officials of Pittsburgh. This is a great step forward in the struggle for the recognition of Professional Engineers.

The following news item taken from The *Pittsburgh Press,* issue of October 22, 1938, tells the story:

"ENGINEERS RECEIVE INCINERATOR WORK. The long awaited engineering contract on the City's proposed new 600-ton a day incinerator was awarded yesterday by Mayor Cornelius Scully to two Koppers Company engineers.

"The award was given Ragnar Berg, chief engineer of the company, who will do the designing of the new plant, and R. L. Smith, the company's construction engineer, who will be in charge of supervision.

"Their fee fixed by Council on a sliding basis will not exceed 6 per cent of the total cost of the incinerator, which Works Director Frank M. Roessing expects to be approximately $800,000 including extra facilities for ash disposal."

CONNECTICUT

REVIEW OF CONNECTICUT ENGINEERS' INSPECTION TRIP TO NEW YORK WORLD'S FAIR

The "Engineers' Special" left Hartford, Conn., promptly at 7:00 A.M. the morning of Oct. 12. Last-moment ticket returns exceeded the Committee's fondest expectations and over 1000 Engineers, representing all branches of engineering, boarded this special train between Hartford and its Harlem River Terminus.

Due to the cooperation of National President Arthur V. Sheriden, it seemed to the group as if practically the entire New York City Police Force had turned en masse to welcome the group.

Through the effort and cooperation of Mr. C. E. Williams, General Passenger Agent of the N. Y. N. H. & H. R. R., and his Assistant, Mr. John Coolidge, all details of transportation were handled smoothly. Upon the group's arrival at the Harlem River Yards, 25 large motor buses were lined up to transport the group to the World's Fair site. Shortly after embarking, and led by a contingent of motorcycle police, the group made their way to the Fair Grounds.

Grover Whalen welcomed the entire group and the list of speakers is identical with that in our last news release, copy of which is enclosed.

Luncheon followed, through the facilities of the N. Y. N. H. & H. R. R. dining car service.

To simplify the Engineers' Inspection of the various projects under construction, bus groups were divided so that not over 150 Engineers gathered at any one spot to listen to an engineering lecture on the various construction features.

At approximately 5:30 P.M., the contingent of buses left with motorcycle escort direct through the downtown traffic of New York to The International Casino in the heart of Times Square. The dinner and floor show surpassed even the Committee's highest expectations.

At 10:30 P.M. the "Engineers' Special" left Grand Central Terminal en route to its various stops between New York City and Hartford, Conn.

The trip was pronounced one of the most outstanding affairs of its kind ever successfully concluded in the Railroad's experience.

A canvass among many of the Engineers present brought out one opinion that was quite unanimous. When asked for their opinions on the construction marvels of this gigantic project, the almost universal reply seemed to be that a project of that sort made possible remarkable engineering accomplishments. When asked further as to their reasonings for such a statement, the reply invariably was to the effect that because of its inherent nature and Fair background, experimental ideas could be tried to successful conclusion, which, in themselves, could hardly be attempted for the more conventional type of industrial and public construction projects.

INDIANA

I. S. P. E. NEWS LETTER

Issued by the Indiana Society of Professional Engineers, Inc.

Editor E. W. WATKINS *Operations Mgr.* W. A. MILLER
Cir. Mgr. G. L. KNOLL

WALKER REPORTS ON NATIONAL CONVENTION

National Director Donald H. Walker at the October meeting presented a very interesting report on the recent convention of the National Society of Professional Engineers in Pittsburgh. The Indiana Society was represented by Pres. S. G. Cohen, Natl. Director Walker and K. B. Wolfskill.

Engr. Walker pointed out the difference in our organization and that of most of the other states in that most of them formed their state group from an organization of various strong local groups while in Indiana the state group was organized first. The local chapters, here, were organized by the state society. In most of the other states, the state society meets but once a year, corresponding to our annual meeting of the society.

One of the principal items discussed at the convention was the education of engineers. It has been proposed that the engineering curricula be enlarged to provide a six year course with the first two years covering purely academic subjects which would be the same for all

branches of engineering. Another proposal would allow the graduate to take his registration examination immediately following the receipt of his degree and then requiring a certain period of actual experience in engineering work before granting of a license by the registration board.

Another subject which came in for a great deal of discussion on the convention floor but on which no definite stand was taken was the "macing" of engineers on the public payroll. Macing refers to the shaking down of public employees for contributions to campaign funds on the pain of losing their jobs.

COHEN ELECTED NATIONAL VICE-PRESIDENT

The Indiana Society of Professional Engineers was signally honored at the convention in Pittsburgh in the election of its state president, S. G. Cohen, as a vice-president of the National Society. Engr. Cohen, one of the founders of the Indiana Society, has served as president of the State Society for the past two years.

WOLFSKILL RECEIVES WELDING AWARD

Engineer K. B. Wolfskill, a structural designer in the bridge department of the State Highway Commission, is the recipient of an honorable mention certificate and a cash award of one hundred dollars for his paper on the application of arc welding in the contest sponsored by the James F. Lincoln Arc Welding Foundation of Cleveland.

Engr. Wolfskill's paper was an illustrated report on the use made of arc welding in the repairs to the Wabash River Bridge at Terre Haute, Indiana. This bridge was recently repaired under traffic by the State Highway Commission and an entirely new roadway slab was constructed. Engr. Wolfskill was responsible for the design on this project.

The papers received were judged by a jury composed of 31 engineering authorities from universities and colleges. Awards were made in a considerable number of classifications of welding.

PUBLICITY AND A PUBLIC RELATIONS PROGRAM

That publicity is an integral part of a public relations program is readily accepted by all, but too little thought has been given by engineers to the other essential elements that are necessary to a well rounded public relations program.

A definition of public relations is difficult to state but it can readily be described. It consists in maintaining good policies in human relationship and in keeping all interested people and the general public informed. It means telling them in plain terms what part the engineer plays in protecting the health and safety of the community at large and showing them that the salary the engineer in public employ is paid is far offset by the economies that such supervision brings. Finally, it includes the acceptance of the social responsibilities which the advance of civilization imposes upon the professional man. Add all of these things together and you have public relations.

Public relations as is said of charity, should begin at home. The engineer can make little headway in improving his relations with the public until he has improved his relations with those with whom he works. The relations between the engineer, the architect, the public works official and the contractor can be improved by recognizing the value of each and the necessity of each for the others. The relations between the engineer employer and his employees can be improved by furnishing a more substantial basis for maintaining employee good will. Since public relations involves attitudes as well as actions the engineer must conduct his operations so as to justify a favorable attitude from his employees.

The engineer is called upon to take part in the social responsibilities of the community. Until he is willing to devote some of his time and activity to the welfare of others in his community he can expect little response to any publicity he may secure on his work, his needs and his value to the public welfare.

JOHNSON AGAIN HEADS CONVENTION COMMITTEE

Engr. M. G. "Ole" Johnson, Ass't City Engineer of Indianapolis has again been appointed general chairman for the annual convention of the Indiana Society of Professional Engineers. Engr. Johnson headed the committee last year which so successfully promoted the first convention of the Indiana Society.

Assisting Engr. Johnson in arranging for the convention are the following committees made up of the members of the Executive Board, assisted by other members of the Society.

Committee to arrange for Speakers: C. "Dolly" Gray, Chairman—assisted by Witt Hadley, Frank Schutt and Earl L. Carter.

Committee to arrange for Convention Quarters, Banquet, Tickets, etc.: Donald H. Walker, Chairman; Walter H. Meitz.

Committee to arrange for Publicity, Reception and Finance: Sultan G. Cohen, Chairman—assisted by E. W. Watkins, and Ray H. Bower.

Committee on Entertainment: Carl M. Geupel, Chairman; Louis A. Geupel.

Committee on Resolutions: Daniel L. Warren, Chairman—assisted by C. A. Broecker.

MISSOURI

BARDSLEY TRANSFERS TO OKLAHOMA A. AND M.

Engineer C. E. Bardsley has resigned from his position as professor of hydraulic engineering at Missouri School of Mines, Rolla, to accept a similar position at the Oklahoma Agricultural and Mechanical College at Stillwater, Okla. Bardsley had served at M. S. M. for eighteen years.

"Doc," as he was usually known, was graduated from the Missouri School of Mines in 1920. In 1926, he was granted the degree of Doctor of Science in Engineering by the University of Michigan. He later attended Northwestern University. During the school year 1928-1929, Dr. Bardsley traveled in Europe as a Freeman Scholar for the American Society of Civil Engineers. He enrolled in the Engineering College of Berlin and also visited other countries to study hydraulic laboratories and methods of research in hydraulics.

He is now a member of the Hydraulic Research Committee of A. S. C. E. and also serves on a similar committee for the Society for the Promotion of Engineering Education. Engineer Bardsley is also a vice-president of the National Society of Professional Engineers.

AMENDMENTS ADOPTED TO SOCIETY BY-LAWS

Heavy Vote Unanimously Approves Changes in Rules

In less than ten days, the necessary ballots were received to adopt the proposed amendments to the By-Laws presented in the last issue of the *Engineer*. At the time of

going to press, there had been received a total of 236 ballots, all indicating adoption of the changes in the rules.

The changes under question involve a minor change in the method of proportioning dues during the fiscal year, and the inclusion of an article on Good Standing.

Final returns of the vote will be tabulated at the end of thirty days after the date of submission to the membership.

NEW ENGINEERING DEAN AT MISSOURI UNIVERSITY

Dr. Harry Alfred Curtis has assumed the duties of Dean of Engineering at Missouri University. Dr. Curtis comes to Columbia from his post as chief chemical engineer of the Tennessee Valley Authority. He takes the place of Dr. F. Ellis Johnson, who resigned to accept a similar post at Wisconsin U.

Before going to the T. V. A., in 1931, Dr. Curtis had taught at the University of Colorado, Northwestern and Yale University.

Missouri is surrounded by states that have engineering license laws.

LEGISLATIVE PROGRAM IS DISCUSSED

Matthew S. Murray, State Administrator of the Works Progress Administration and chairman of the Special Committee for Registration, presided at a meeting held in Jefferson City in October for the purpose of discussing and formulating plans for sponsoring legislation to regulate engineering in Missouri.

The meeting was open to all members of M. S. P. E. and to others interested in the proposed bill. Special invitations were extended to the architects of Missouri, who are jointly concerned in the legislation.

The program, arranged at a conference between Engineer Murray and Engineer Carlton, president of M. S. P. E., included an afternoon meeting in which ample opportunity was given those interested to discuss the provisions of the proposed bill. The present bill has been produced by a series of meetings and a great deal of correspondence. Legal talent was employed to put the required provisions into a form that should be acceptable to the Legislature.

During the afternoon meeting, the members of the various committees necessary were appointed. These committees will begin to function immediately in order that the members of the Legislature will be aware of the desires of the engineers.

Also on the program for the day, was an evening meeting of the committees that will be responsible for promoting the interests of the bill in the Legislature. These included the Steering Committee; the Ways and Means Committee; and the Contact Committee.

M. S. P. E. PAVES THE WAY

The desirability of regulating engineering in Missouri has long been recognized by the leaders of the profession in this state. These leaders have tried many times to bring about the adoption of adequate legislation and each time have met with heartbreaking failure. The failures were not the fault of the leaders—the real fault lay with the engineers, the profession, for as such it did not exist as an organized group.

The picture is entirely different now. The engineering profession in Missouri, as well as in twenty-three other states, is organized and is ready to support measures which will help to improve the standing of the profession.

Here in Missouri the leaders of the profession can again go to the Legislature and know that they have the support of the engineers of the state as a whole. The Missouri Society of Professional Engineers is the one organization that makes possible the representation of all engineers in a common cause.

The Society was not organized to take the place of any existing organization nor to usurp the functions of the established technical groups. It was organized by the members of these groups to further the work of obtaining a professional status for those who are qualified for it. The whole-hearted support of the members of the Society will mean that the Legislature will soon find out that the desired regulation is the desire of all.

The Society is now paving the way to a successful campaign and it must give credit to those who have worked so valiantly in the past, they laid the ground work and kept the issue alive. The members of M. S. P. E. can now give the issue weight.

A profession dealing with public safety of life, health and property should be a public concern and the profession itself should take steps to regulate its practice before the public finds it necessary to do so.

NEW YORK

BROOKLYN ENGINEERS' CLUB

The Regular November Meeting of the Brooklyn Engineers' Club was held at the Club House, No. 117 Remsen Street, Brooklyn, on Thursday Evening, November 10, at 8:30 P.M. Paper No. 295, entitled *Conquest of Space by Rockets* was presented by Engineer Alfred Africano, President American Rocket Society.

Rockets and rocket ships took on an unexpected reality when some days ago of a late Sunday night peaceful citizens all over the nation had their heart beats quickened by a "News-Flash" that a monstrous rocket ship from "Mars" had plunged to earth shattering the peaceful quiet of the night enveloped New Jersey countryside. That the rocket ship turned out to be an imaginary one was a great relief to all those who had given it mistaken reality. However, without a doubt, interest in rockets and rocket ships has reached a new high and has imparted to this lecture an element of great timeliness.

Though we do not think that Engr. Africano and his brother scientists are quite ready as yet with rocket ships to take us to the planets, they are approaching a point along the road of development where they are in sight of practical applications. The work which these men of science have done and are now doing with rocket propulsion is of great portent and their task takes on the glamour of romance when one pursues the line of speculation as to what rockets may do for us some day in the future. There is little doubt that experiments in this medium of travel (or space annihilation, if you please) will lead to developments beyond the imagination of the ordinary planet bound inhabitant.

Engr. Alfred Africano is one of the country's outstanding authorities on rockets and rocket flights. He has written many articles on this subject, and about one of these fundamental research papers, the *Scientific American* says: "His Paper will be a classic from which references will be drawn for many years to come."

Engr. Africano is one of the top ranking younger engineers. (See *America's Young Men*, 1938-39 Vol.) He is a graduate of Stevens Institute of Technology (ME

1929) and a member of the New York State Society of Professional Engineers.

BEC MEMBERSHIP ROSTER

During the coming month preparations will be gotten under way for printing a new Membership Roster. To assure the correct and complete listing of all names the Roster Committee will appreciate having changes in addresses, etc., brought to the attention of the Editor. As previously announced, the cost of this publication will be borne by advertisements. A page ad costs $25, size 2¾" x 6½" — half page $15, size 2¾" x 3½" — quarter page $10, size 2¾" x 1⅝". Please communicate with the Secretary for further information.

INSPECTION TRIP—NEW YORK WORLD'S FAIR STRUCTURES

An inspection trip was arranged to view the World's Fair grounds and structures November 19, through the courtesy of its chief engineer, Colonel John P. Hogan. The Fair Corporation provided guides who explained the special features at each location. Chairman of the Inspection Committee, Arthur W. von der Linn.

BUILDING FUND FOR CLUBHOUSE RENOVATIONS

The list of members who have made contributions to the fund for the renovation of the Club House is again published, together with the names of those who made contributions since the publication of the list in the October *Bulletin*.

The Board of Directors again extends its thanks to the members who have contributed toward the much needed improvements. Though much has been done to improve our clubhouse, considerable work remains to be done, and those members who have not as yet contributed are asked to send in their contributions.

Transcript of Minutes

(Continued from page 4)

to represent them in Washington as they would if they lived, perhaps, in Utah, and that probably illustrates some of the problems that you have and we have considering the ways of the world, that there are too many of us in the East, and we, perhaps, have too little representation so that 9,000,000 of us in Pennsylvania, for instance, have two Senators, and a few hundred thousand in New Mexico have two Senators, and all four Senators have exactly the same vote, and naturally our members don't register the way we think they should.

That means that not only in business but in Government, we have problems of harmonizing our rights and our needs. You men of the engineering world coming to Pittsburgh here to discuss your problems must at times wonder if the business men to whom you look oftentimes for the sinews of war in the shape of money, appreciate you, and vice versa, and it is a great problem of coordination and cooperation. And sometimes it is much easier to get cooperation than coordination.

Yet, as I see it, the problem that faces you gentlemen and business people generally in the world, it is very necessary that we get cooperation and coordination throughout the world. The difficulties of the matter remind me of the story of August Briske and his family. They had a bright boy that succeeded in getting on his commencement program. The family was very happy and pleased to think that he was going to speak, and they didn't pay a whole lot of attention to it until the night before the exercises when they got to discussing his clothes. They all agreed that his trousers were too frayed and couldn't be used, and that he would have to use his father's, but he was a little shorter than his father, and that was his father's only pair of trousers. He said they couldn't be cut off, and they decided to roll them up and wear his fathers' trousers rolled up about 6 inches.

Well, that caused a burst of tears, and the mother was terribly worried, and the sister was upset, but that was the best they could do, because the father was certain he wasn't going to sacrifice his only trousers. So they went to bed but not to sleep. The mother had promised to cooperate and she thought of it during the night. So she decided to cut off the trousers and hem them up, and run the chance of what the old man would say after discovering it, so she cut off about six inches.

In the meantime, the sister was lying in the next room and worrying about this too, so in the night she got up and cut off six inches too, and the result was rather disastrous, because they didn't coordinate their efforts. (Laughter)

So it seems that in this world, of which we are all a part, we are eager to do things, but don't know how, and I think meetings like this teach us how.

We are happy and proud in the city of Pittsburgh to have you here. You know, of course, you are welcome in any of our plants. You are particularly welcome in our Westinghouse plant. We are not as busy as we would like to be, and there are some things very interesting to you if you want to go out. We would be very glad to have you, and I am sure the same would be true of any other business here.

Engineering Advances Through Scientific Research

(Continued from page 17)

and more research. Strange to say, scientific research, through its accomplishments, is far ahead of education as regards achievements in these specialties. In this research the directors have had to rely for personnel upon mechanical engineers, chemical engineers, and physical chemists, who through unusual talents could be developed rapidly into expert researchers.

These cases illustrate the beneficent circle of scientific research and engineering. The former results in new knowledge of matter which in due course is translated into industry. Industrial development calls for engineering of a new type. And the problems of the engineer require still further scientific research, to the end that the needs of mankind may be better fulfilled.

Annual Report N. Y. State Board of Examiners

(Continued from page 15)

During the year no charges were filed with the Board seeking the revocation of a license. No amendments were made to the law during the 1938 Legislative session.

The personnel of the Board as of June 30, 1938 is as follows:

VIRGIL M. PALMER, *Chairman*
NORMAN R. GIBSON, *Vice-Chairman*
ROY G. FINCH, *Secretary*
ERICH HAUSMANN
DAVID B. STEINMAN

REGISTRATION BOARD APPOINTED

Governor Chandler has just appointed the Members of the Kentucky State Board of Registration for Professional Engineers. The Board will be composed of the following Professional Engineers all of whom are members of the Kentucky Society of Professional Engineers:

T. H. Cutler, State Highway Engineer, Frankfort
G. T. Howard, Kentucky River Coal Corporation, Lexington
J. R. Kinsella, Consulting Engineer, Newport
E. R. Ronald, Consulting Engineer, Louisville
C. S. Crouse, University of Kentucky, Lexington

In addition, Col. James H. Graham, Dean of the College of Engineering, University of Kentucky, is a member of the Board, ex officio, by virtue of his position.

The Board will hold its first meeting the early part of next week and will organize and get ready to function at the earliest possible time. As soon as organization is complete and procedure is formulated members will be informed of the proper method to follow in making application for registration.

(Signed) C. S. CROUSE,
Secretary-Treasurer.

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Telegraph Bldg. Harrisburg, Penna.

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RESOLUTION

Adopted at the Fourth Annual Convention of the

NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS

Oct. 17, 18 & 19

WHEREAS, this Convention has been cordially greeted and pleasantly entertained during our days in Pittsburgh; and

WHEREAS, we know that this hospitality has been due to the personal efforts of the Convention Committee, set up by the Pittsburgh Chapter of the Pennsylvania Society of Professional Engineers.

NOW, THEREFORE, BE IT RESOLVED, by the National Society of Professional Engineers in convention assembled in the city of Pittsburgh at the Fourth Annual Meeting, October 19, 1938, that a vote of thanks be tendered the Convention Committee of the National Society of Professional Engineers, for their thoughtful attention which afforded us pleasure and entertainment.

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